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# THE IRON AGE

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# THE IRON AGE

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SEPTEMBER 3, 1936

ESTABLISHED 1855 Vol. 138, No. 10

# How Times Have Changed

PRESIDENT ROOSEVELT is on record as holding the belief that improvements in automatic machinery have put and kept many people out of work. Many of his close advisers in the New Deal, including Mrs. Roosevelt, are known to regard improved machinery as a job-destroying monster.

Sometimes we let our imaginations run away with us in such matters. If there ever was a potential job-eating monster, it was that known as "Camco."

Camco was the nickname of the now defunct Consolidated Automatic Merchandising Corporation, which was a "trust" formed by the consolidation of a number of companies making automatic vending machines. This company was going to "mechanize" selling—replace clerks behind the counter with machines which would be almost human. Some of them were such skilled robots that they would make the sale, give the change to the customer, say thanks to him and deliver a nice little sales talk.

To show how ambitious were the plans of this company, the stock prospectus, issued by F. J. Lisman & Co., in September, 1928, painted estimated net profits by 1933 as likely to be over $17,000,000. That, of course, would mean a gross volume of business per year of at least $60,000,000, for no conscionable corporation could think of earning more than 30 per cent.

Elsewhere in this same stock prospectus, the story is told of a machine in operation "at the Main Post Office in New York, which makes an average of about 500 transactions a day, thereby doing about one clerk's work." This, at a cost of only one dollar per day.

On this basis we can figure just how many white collar jobs this Frankenstein was expected to eat up. For each dollar of sales per day, automatic machinery would replace one clerk. Sixty million dollars per year equals $200,000 per day for a 300-day year, allowing for Sundays and holidays. Thus the expectation was that the new vending machines would replace 200,000 clerks by the fifth year of the company's existence. As the prospectus euphemistically put it, they "would be released for more constructive purposes."

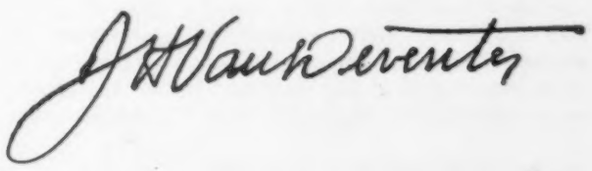
Of course, if the company continued to progress in the expected geometrical proportion as disclosed by the prospectus, by 1936 there might not have been any jobs left for white collar people in retail merchandising.

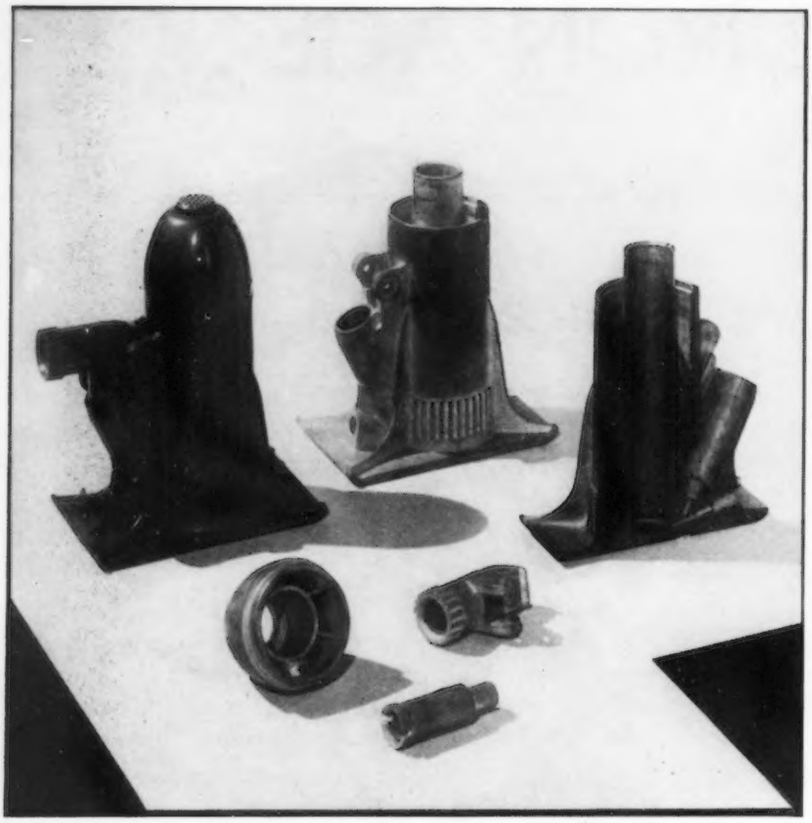
Lest you get the idea that this mechanical Frankenstein brought on the depression, let us reassure you. The company went "phooey" and every stockholder inveigled into parting with $55 per unit for the stock, lost every dollar invested.

It just goes to show that you cannot believe all that you hear or read about the automatic machine as a job eater.

Among the names of the officers and directors of Camco, on this stock prospectus of September, 1928, appears the name of Franklin D. Roosevelt of New York.

**How times have changed!**





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THIS new hydraulic jack, made by the Blackhawk Mfg. Co., illustrates the use of die castings to reduce the number of parts to a minimum. The cylinder, reservoir and pump chamber are all a single casting as shown by the sectional view. Protective chemical treatment is indicated for the interior surfaces.

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# *Coloring* of Metals . .

o o o

By HERBERT R. SIMONDS and C. B. YOUNG

o o o

ZINC is one of the fortunate metals now enjoying increasing acceptance by American industry. Because of the widening scope in application of die castings and the facility with which zinc alloys are adapted to this form of metal fabrication, the coloring of zinc generally and of die castings specifically assumes added importance. Commercially, relatively little is being done in the field of coloring zinc, but in the laboratory many interesting processes have been developed and the few applications which have reached the commercial stage seem to have important features.

The Cronak process controlled by the New Jersey Zinc Co. is now being used to increase the life of zinc coatings as well as to preserve the surface of zinc alloy products. Demands for longer and longer life of galvanized wire and galvanized fittings, especially in railroad electrification and in telephone work, have lead to the development of new zinc coating processes, of which the electrogalvanizing processes of the Bethlehem Steel Co. and of Langbein-Pfanhauser (of Germany) are outstanding. By these and other recent processes it is now possible to apply heavier coatings of zinc to wire than previously was the case, and thus if the Chronak method of

EXCEPTING iron, zinc is the cheapest industrial metal. Therefore, the problem of properly finishing zinc and zinc alloys is an important one. Strangely, little has been done in the field of chemical coloring. This article, which is the fourth in a series on the coloring of metal, describes the few commercial methods of coloring zinc and also outlines the chief research now in progress. Other features covered include electroplating of die castings and galvanized iron and the alloying of zinc for finish effect.

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FOR kitchen appliances, zinc parts are electroplated where they come in contact with food and are lacquered elsewhere.

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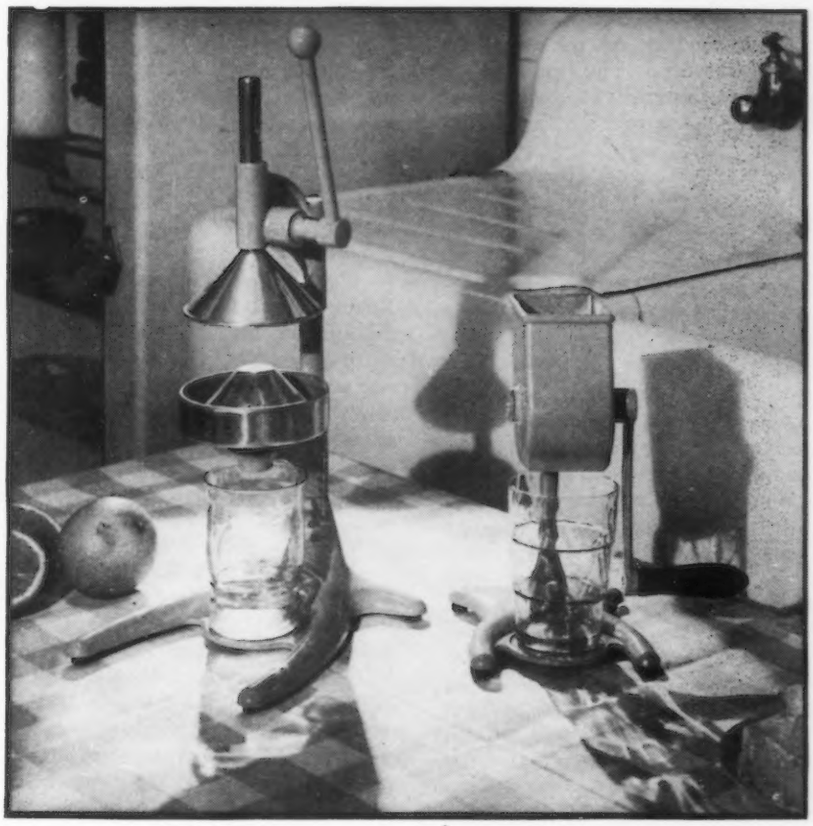


# (4) Zinc and Die Castings . . . .

**Previous articles in this series have covered iron and steel, copper and other nonferrous metals and aluminum. The next article will discuss metal coloring processes and some commercial considerations.**

**Mr. Simonds is vice-president of Metal Products Exhibits, Inc., Rockefeller Center, New York. Dr. Young, associated with Dr. Colin G. Fink at Columbia University as an instructor in chemical engineering, is technical director of the United States Research Corp., Long Island City, N. Y.**

surface protection is added to these new heavy coats the life of galvanized wire may be extended beyond anything thought possible some years ago.

With the exception of iron, zinc is the least expensive metal for industrial use, and, therefore, with the new surface consciousness toward all metal products, the finishing of zinc, whether by enamel or by metal coloring, is bound to become systematized and extended in the near future.

In previous articles in this series on "Coloring of Metals" various processes have been considered other than chemical coloring. These processes have included alloying, heat treating, plating, and electrochemical treatment. Heat treating has little or no place in the surface effect to be produced on zinc or zinc alloys. Alloying has a more important role in coloring zinc base products and will be considered briefly here. The chief processes described in this article, however, are chemical, electrochemical, and electroplating.

Zinc loses weight under exposure by the formation of films composed of oxides, carbonates, chlorides, or combinations of two or more of these. The exact nature depends on type of exposure as well as condition of the base metal.

In the laboratory, and commercially to some extent in Europe, brown, black, blue, and even purple colors are produced on zinc. The black colors seem to have particular promise and several methods warrant attention. There is one known as the Schulein process which makes use of low voltage alternating current passed through a solution containing chromic acid

and sulphuric acid. Usually the parts to be thus coated constitute the electrodes. The coating is black and under certain conditions has good corrosion resistance. This process has been experimentally used for continuous treatment of galvanized wire to give added corrosion resistance.

Another process is the anodic process which is similar to that described in a previous article for aluminum. When zinc parts are made the anodes in an electric circuit with an electrolyte composed chiefly of dilute sulphuric acid, a porous film is produced which lacks the hardness and bond of the oxide film on aluminum but which nevertheless is sufficiently interesting to encourage experimenters to continue with its development. By modifying some of the variables it seems possible that a good base for dyes eventually may be secured. Some success is reported through the use of barium hydroxide as the electrolyte with an increasing potential through the bath. This particular method is being used in England with some practical applications claimed.[1]

## Some Specific Formulas

An ebony black is produced by cleaning zinc coated products or the usual zinc alloy die castings and then immersing them in the following solutions: Copper nitrate, 1 oz.; ammonium chloride, 1½ oz.; cupric chloride, 1 oz.; hydrochloric acid, 1 fluid oz.; and water, 1 gal. This solution should be used at 100 deg. F. After drying, the parts are brush finished and then heated to 160 deg. F. for 15 min., after which time the black color will be set. Parts can then be dry scratch brushed and protected by transparent lacquer. If the parts are sand blasted before lacquering a dead black finish can be produced.

Another method of producing black on zinc is to immerse the part in the following solution: Copper sulphate, 16 per cent; potassium chlorate, 8 per cent; and water, 1 liter. The color becomes deeper with greater length of time of immersion, but 5 min. is usually sufficient to produce a satisfactory black.

Combinations of electrolysis and chemical action may be used to produce interesting color effects on zinc. For instance, if zinc is made the cathode in a solution containing from 3 to 5 oz. of ammonium molybdate per gal. of water, with a low voltage current from 2 to 20 amp. per sq. ft., the zinc will assume a wide variety of colors varying from a golden yellow to a lavender blue and finally to a jet black. One of the authors (Dr. Young) has produced attractive designs by this method, using a platinum anode. This same process will work on aluminum, iron, and tin, although in each case the actual surface condition of the metal is important in determining the resultant color. As a general rule, rough coatings work best with the brighter colors, and polished surfaces with the dark colors. If the current ranges toward the 20 amp. mark and electrolysis is allowed to continue for about 5 min., the color will grow gradually darker until finally the deep black is produced. Mere immersion in a solution of ammonium molybdate for sufficient length of time will also produce black.

Four interesting methods of producing brown colors on zinc are as follow: Die castings after chemical cleaning are immersed in a bath containing 250 grams of chromic acid per liter of water. The castings are connected as electrodes in a low voltage circuit using alternating current. A dark brown color appears in from 1 to 3 min.

Another means of producing brown on zinc is through the formation of a cuprous oxide which can be obtained by immersing zinc parts in a solution containing 2 lb. of copper nitrate and 1 gal. of water. The resultant color while pleasing is not stable and must be protected by transparent lacquer.

A third method of producing brown on zinc is to paint over the surface of well cleaned castings or other zinc alloy parts with the following solution: Copper sulphate, 6 oz.; sodium carbonate crystals, 4 lb.; sucrose, 9 oz.; and water, 1 gal. The purpose of the sucrose is to prevent the precipitation of basic copper carbonate. After painting, the solution is allowed to dry and is then washed and dried a second time, after which it is usually protected with lacquer. An attractive rich brown color may be produced on zinc by immersion in the following solution: Sodium thiosulphate, 124 grams; lead acetate, 38 grams; and water, 1 liter.

## Brighter Colors

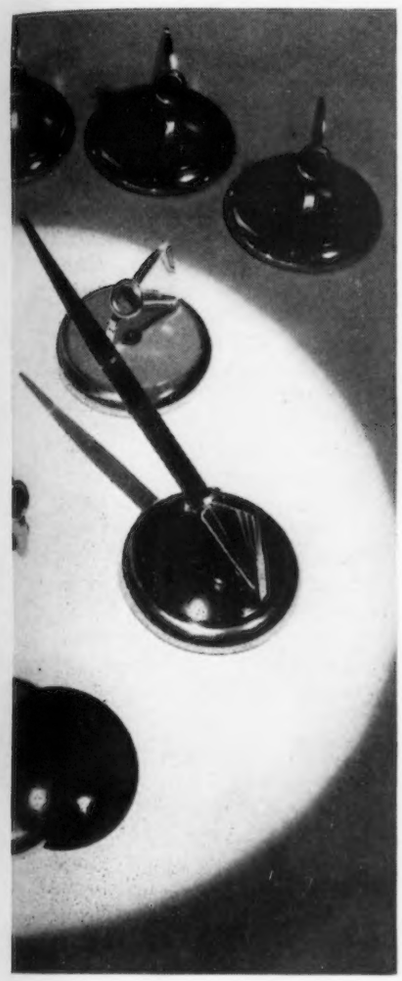
A combination of cobalt and ammonium chloride in a solution will produce steel blue on zinc die castings. The instructions for producing this color are merely to immerse clean parts in a solution containing 60 grams of cobalt and 60 grams of ammonium chloride to 1 liter of water. When nickel ammonium sulphate is used with ammonium chloride, a bright purple is obtained by much the same process. In the latter case the solution should contain 60 grams of nickel ammonium sulphate and 60 grams of ammonium chloride, and should be held at 140 deg. F. during the immersion which takes from 3 to 5 min.

Nearly all of the compounds of zinc are white, which is the reason

COMBINATIONS of metal and fixtures. Pleasing effects may the metal

[1] See United States patents to the New Jersey Zinc Co., Nos. 1,953,997, 1,953,998, 1,953,999 and 1,954,000.

that the metal is not more readily colored. Sulphide of zinc is white which is a rare exception among metallic sulphides. For this reason the best way to proceed in tackling the problem of coloring zinc is to produce salts of other metals on the zinc surface. Zinc lends itself to this action readily



lacquer finish are popular for desk be secured by chemically coloring surfaces.

as it is high in the electromotive series and therefore active. Some of the typical reactions are:

$$Zn + CuSo_4 \rightarrow Cu + ZnSo_4$$

or even from the cyanide,

$$Zn + 2CuCNKCN \rightarrow Zn(CN)_2 .2KCN + Cu$$

Zinc will also displace gold, silver, lead, tin, and mercury from aqueous solutions.

Immersion in a solution of copper tartrate and caustic soda may be used for producing some beautiful bright colors. A good formula is: Copper tartrate, 1½ lb.; caustic soda, 2 lb.; and water, 1 gal. If this is held at 110 deg. F. yellow, light brown, crimson, blue, purple, and light green may be produced with variation in immersion time. The changes take place rapidly and are difficult to control. If the solution is used at a lower temperature the reactions are slower and better control is therefore gained at some sacrifice to color brightness.

Several solutions may be used to produce similar iridescent sequences of colors on most zinc alloys. One solution consists of: Copper sulphate, ½ lb.; cream of tartar ($KHC_4H_4O_6$), ½ lb.; sodium carbonate, 1½ lb.; and water, 1 gal.

A thin adherent coating of arsenic on zinc is produced by using the following solution: Arsenous acid, 6 oz. per gal.; potassium cyanide, 10 oz. per gal.; sodium phosphate, 2 oz. per gal; and water, 1 gal. The bath is usually worked hot, but the coating will form in a cold bath. When held about 110 deg. F., a stable close-adhering gray coating is produced in from 2 to 3 min. This particular coating seems to have good commercial possibilities as it is easily applied and gives a pleasing stable finish. It forms a good base for lacquers.

## The Cronak Process

The Cronak process also is relatively easy to apply as it involves a simple immersion in acidified sodium di-chromate solution. The chemical reaction resulting from this immersion causes an insoluble film to be deposited on the surface of the metal. The film as it is deposited contains a small amount of a slightly soluble material which is corrosion inhibiting and thus protects the zinc surface when moisture comes in contact with it. The color of the film varies from a light greenish-yellow to a deep yellow brown depending upon the nature of the base metal and the time of the immersion. The presence of copper, which is included in some commercial zinc alloys, produces a more definitely greenish color. In any case, however, the thickness of the deposit, and therefore the degree of protection, may be determined after a little experience by the color produced, as the color variation is in direct proportion to the film thickness.

Strictly speaking, the color of the Cronak coating is not particularly decorative. Nevertheless, the process is being used by some producers of die castings to improve the appearance as much as to protect the surface. Quoting from one engineer: "This new Cronak process gives a visible protective coating that materially reduces the corrosion rate and prevents the formation of white corrosion under many conditions where it would otherwise form on zinc or cadmium. The film has an appearance not unlike brass with a greenish brown iridescence."

Because of the commercial acceptance already acquired by the Cronak method and also because announcement of the process has been made only within the past two months, a report of one of the New Jersey Zinc Co. engineers is here reproduced in considerable detail.

## Tests of Cronak Process

"The inhibitor contained in the coating formed by the Cronak process definitely prevents a formation of loose bulky corrosion products and reduces the normal rate of corrosion of the metal. Since the inhibitor is of a slightly soluble nature, it will ultimately be removed by moisture coming in contact with it. The slight solubility of the inhibitor is advantageous in cases of total immersion in water, since it permits protection of areas from which the film may have been abraded by rough handling and, in the case of galvanized iron, it permits some degree of protection to exposed areas of the iron itself. The Cronak process will normally find application for the protection of zinc in two distinct fields: (1) where moisture coming in contact with the film is either entrapped and is never permitted to cease contact with the surface or is insufficient in quantity to run off, and (2) where variable volumes of moisture contact the surface and run off carrying with them a small amount of dissolved inhibitor.

"It is apparent in the first case that where the prescribed conditions obtain, the inhibitor is not lost but will continue to be present whenever moisture contacts the surface. Under these conditions, the life of the film and the protection which it affords to the zinc surface will be indefinitely long. The cases of carburetor and automotive door lock assemblies and of the white rusting of galvanized sheets in storage and during ship-

ment fall, in general, in this classification.

"It is more difficult to give even an approximate estimate of the duration of the protection to be expected from the film under conditions where the water runs off the surface. It is apparent that since a definite amount of inhibitor is present, the duration of its protection will depend upon the frequency and duration of water contact. Test data which are available from a number of experimental exposures will give some idea of the scope and duration of the protection afforded by the film. Outdoor exposure tests have been under way for the past 3½ years in an Eastern semi-industrial location. At the end of this period, there is still sufficient inhibitor present in the coating, which is still highly colored to prevent the appearance of corrosion products. Weight change measurements obtained over a period of 2½ years under these same exposure conditions show a 30 to 50 per cent decrease in the weight normally lost by zinc as the result of corrosion. The trend of the data shows clearly that the degree of protection was constant throughout the entire 2½-year period[2]. Just how long the film will maintain its protection can be ascertained only from tests of considerably longer duration.

MANY automobile hood ornaments are now die cast. They are usually chromium plated but designers are now experimenting with different color effects through chemical treatment.

"Exposures in climates in which the rainfall is greater, or less, than that obtaining in the above tests will naturally decrease, or increase, respectively, the life to be expected from the film. It is apparent, however, that so far as the general type of atmosphere to be encountered in this country is concerned there is every reason to believe that the film will afford its full protection for a reasonable number of years. It is of some interest in this connection to note that the film is substantially resistant to the salt spray test, from which it may be implied that it may offer special advantages in sea-coast locations.

"Some tests carried out to study the Cronak process, under extreme conditions of exposure, have demonstrated that while the major protection is afforded by the soluble inhibitor, there is every evidence that the insoluble portion of the film can, in itself, greatly hinder the spreading of corrosion after the soluble material has been removed. For instance, a test was made in an atmosphere saturated with moisture at 104 deg. F. In a chamber operated under these conditions, moisture is constantly condensing on the objects contained therein and dripping away. The test is, therefore, somewhat comparable to a slow stream of running water at 104 deg. F. Under these conditions, an exposure period of one year was required before white corrosion products became evident in a few scattered areas on the specimen surfaces. The brownish color of the soluble material was largely removed by this treatment, leaving only the greenish soluble film. As the exposure was continued, it was found that the spots at which corrosion had initiated did not spread as rapidly as would be anticipated in the absence of the soluble inhibitor[3].

"An even more striking demonstration of the ability of the film to prevent the corrosion of zinc over long periods of time under especially adverse conditions was obtained in a test in which untreated specimens of galvanized iron and specimens subjected to the Cronak process were totally immersed in separate small volumes of boiled distilled water which was changed every two weeks. The corrosion of zinc in boiled distilled water tends to be relatively rapid with the production of voluminous white corrosion products. Under these conditions of immersion, the untreated specimens showed rusting of the basis metal after 15 weeks. Those specimens which had been subjected to the Cronak process showed first signs of basis rust after 130 weeks.

Certain difficulties encountered in zinc alloy die cast carburetors and automobile locks were attributed to the presence of white corrosion products. The Cronak process has been used very generally

[2] In neither of the above cases has the soluble portion of the film been removed under the exposure conditions encountered. It is expected from other tests that the insoluble portion of the film will continue to protect the zinc surface to some extent even after the soluble inhibitor is no longer present.

[3] An untreated specimen exposed under these same extreme conditions was covered with white corrosion products in a few days.

on these parts for over a year now and has successfully removed the factor of white corrosion products and the possible causes of this difficulty. We have heard absolutely no complaint concerning the sticking of locks since this process has been in use, and the appearance of white corrosion products in carburetor bowls has removed this from the possible causes of choking the orifices."

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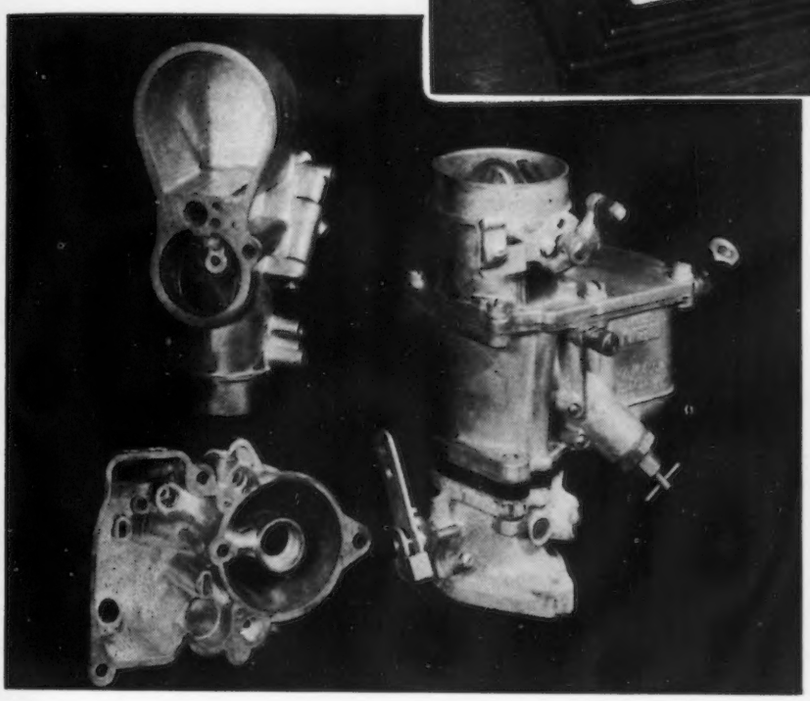


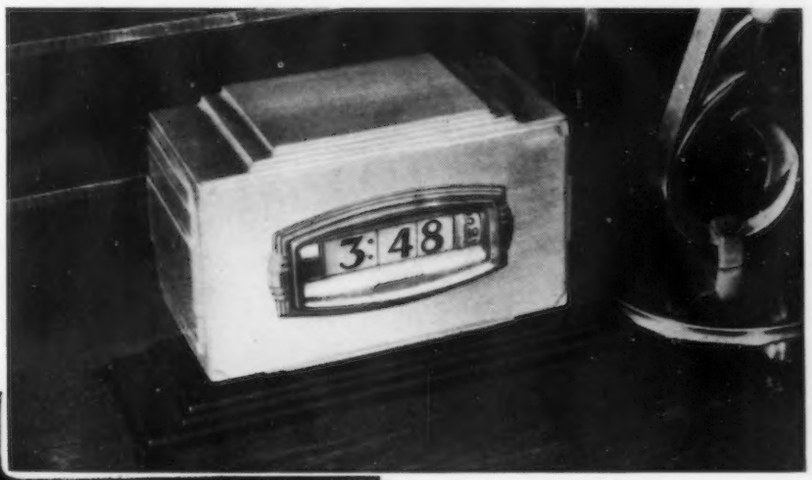
BELOW

PROPER carbureter operation requires clean surfaces which do not clog. Die castings are excellently suited to carbureter construction except for the surface formation of white films. This difficulty is said to be completely eliminated by the Cronak chemical treatment.

## Plating Zinc

Zinc may be plated and therefore all the possibilities previously described for electro-deposited coatings on other metals are open for zinc and zinc alloys, it being understood, however, that some special adaptation of procedure is occasionally required. Zinc die castings present a pleasing appearance just as they come from the molds and, if they are polished, the surface effect with some of the alloys used is not unlike chromium. However, such a surface is not stable unless protected, and electroplating as well as lacquering is frequently employed for this purpose.

Among the electroplates desired for zinc is nickel which gives a pleasing finish by itself and also furnishes a good base for chromium plating. However, in order to plate nickel on zinc, several factors must be taken into account. Zinc is more reactive than nickel and thus has a tendency to displace nickel from its compounds. When zinc metal is placed in a solution of nickel sulphate it will precipitate metallic nickel and go into solution as zinc sulphate. The nickel thus produced is usually non-adhering, spongy, and unstable for a finished coating. Thus this particular reaction must be avoided if a stable plate is to be formed. Several methods have been devised. One is to increase the current density and another is to use a separate nickel bath to strike the zinc products and then plate in ordinary baths over the flash[4]. A good nickel bath for such special strike purposes is as follows: Nickel sulphate, 14.5 oz.; nickel ammonium sulphate, 6.7 oz., and water, 1.0 gal. With this bath a current of 55 amp. per sq. ft. should be used for 45 sec. If certain organic compounds are added to the nickel baths they have the effect of suppressing the ionization of the nickel salts and thus afford another way to overcome the difficulty referred to above. An organic compound which may be used to advantage is sodium citrate. It is also possible to decrease the ionization of nickel salts by adding a common ion such as potassium, sodium, or magnesium sulphate. Two typical formulae are as follows:




ABOVE

THIS modern jump clock has a die cast case with a scratch brush metal appearance known as a Butler finish. Photo courtesy of New Jersey Zinc Co.

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**Formula No. 1—(Inorganic)**

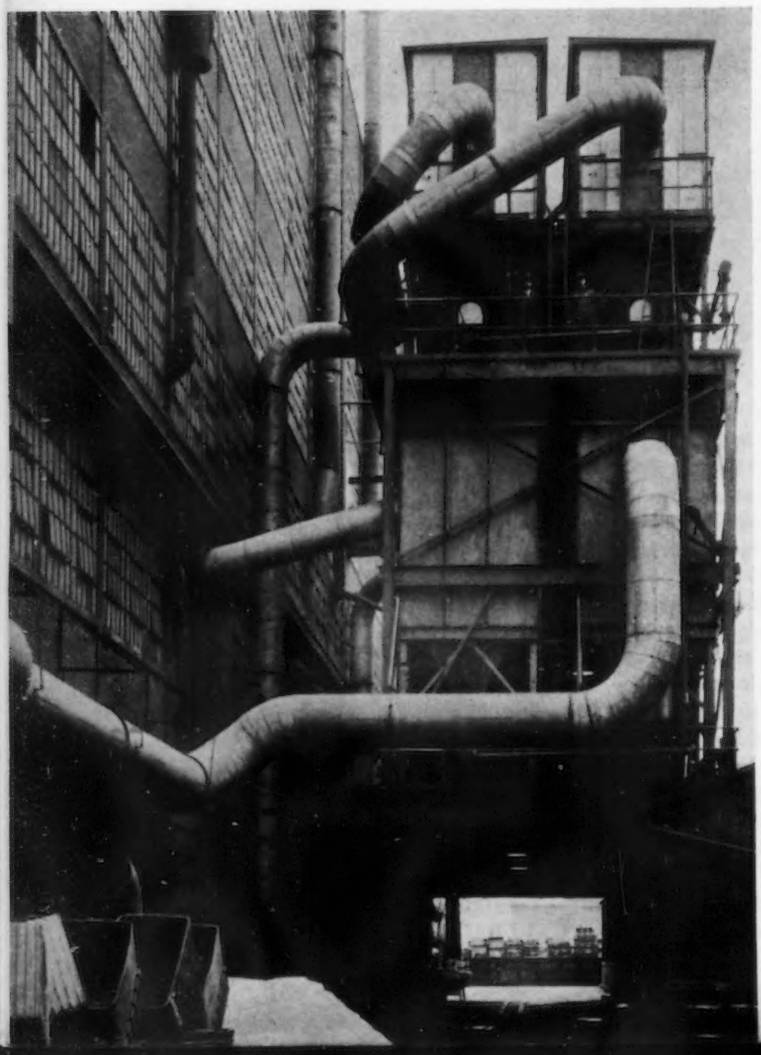
Nickel sulphate, 10 oz. per gal.; ammonium chloride, 2 oz. per gal.; sodium sulphate ($Na_2SO_4 10H_2O$), 22 oz. per gal.; boric acid, 2 oz. per gal.; the pH is 5.6 and the solution is used at room temperature at a

(CONTINUED ON PAGE 110)

[4]This method has now been largely superseded by the use of very thick under-deposits.

# Dodge spends ..on Foundry Air-

A NEW air-cleaning system handling a total of 750,000 cu. ft. of air per min. has been put to work in the foundry of the Dodge Division of Chrysler Corp., Detroit. In withdrawing the air for washing, and in supplying fresh air, 52 powerful suction fans are used, handling over 800,000 cu. ft. of air per min. and requiring a total of 1174 hp. for their operation. Improvement in working conditions has been obtained at great expense. Altogether, the installation, which was recently completed, cost over a quarter of a million dollars.



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OUTSIDE view of the east bank of dust collectors, showing the double deck arrangement of dry collectors.

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The new air-cleaning system is divided into four sections, a battery of east side dust collectors, west side dust collectors, smoke exhaust, and fresh air supply. Fresh air is supplied at four shakeouts, and the total volume handled is 76,180 cu. ft. per min., a total of 90 hp. being required. The smoke exhaust system removes smoke at the shakeouts and also from the tunnels on the cooling sections of the mold conveyors, as well as from the hoods over the pouring zones. For this system alone, 458,880 cu. ft. of air is handled through 20 fans driven by motors ranging in size from 3 to 50 hp. and requiring a total of 289 hp.

From the dust collecting systems, both east and west, approximately 75 to 80 tons of sand and dust is collected per day through arrestors which involve both wet and dry units. The output of each system ultimately is collected in water and pumped to a central point where the solids are removed and later dumped into railroad cars for removal from the premises. For the east system there are two cloth screen dry dust collectors connected to hoods over two cylinder sand blast machines and five dry dust collectors handling the exhaust from swing snagging grinders, tumbling mills, core grinders, a waste sand conveyor and a group of cylinder blow-off booths. There are also six wet dust collectors handling the exhaust from hoods

# $250,000 Cleaning Installation

over the cooling conveyor transfers, the sand blast conveyor transfers, two shakeouts and a cylinder blow-off booth. The equipment is supported off the ground on structural work running up four levels. Altogether, the east side system handles a total volume of air of 191,680 cu. ft. per minute and uses a total of 540 hp. in motor sizes ranging from 10 to 100 hp. The largest size motor handles the exhaust for the tumbling mills.

In general principle, the dry dust collectors act as filters which simply strain the dust-laden air passing through cloth. These cloth bag dust collectors are nothing more than vacuum cleaners on a large industrial scale. The exhaust fans suck the air through the bags so that the impellers come in contact only with cleaned air. The bags are spread over steel frames or wire separators which can be shaken at intervals to knock free the dust which collects on the outside of the bag. The dust or sand collects on the outside of the bags and when shaken off is deposited in a trough through which is circulated a stream of water. From a sump, dirty water is pumped up to the central settling system.

Between the two batteries of dry collectors are the six wet dust collectors. These collectors are in the form of towers through which the wash water is pumped. The air is introduced into the tower at the bottom. The bottom cone of the collector acts as a wet cyclone, collecting at that point all of the heavy dust and sand particles. Dirty water from these towers is collected in a central trough which enters the main system.

A series of nine wet dust collectors is also used on the west side system. These collectors receive dirty air from various points of the sand preparation equipment and from both the motor block and small parts shakeouts. This system handles a total volume of 91,330 cu. ft. per min., with a total of 255 hp. divided between nine 25 to 30 hp. motors.

Liquid settling in the collecting

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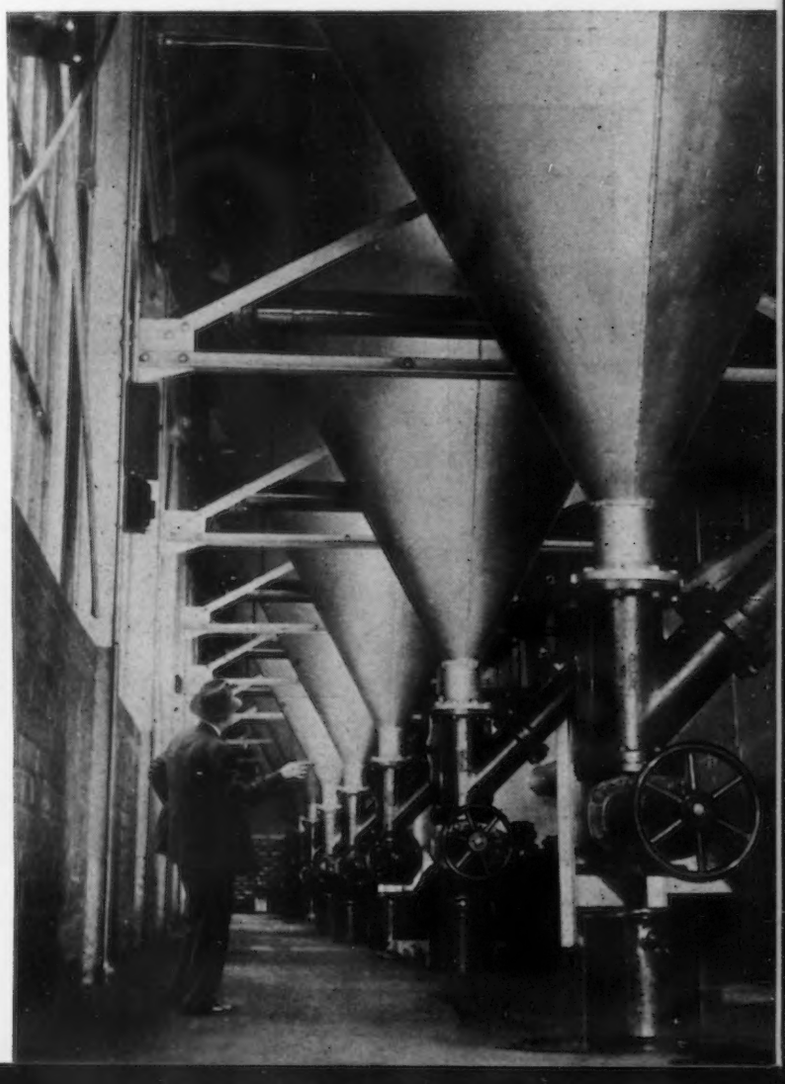

BATTERY of nine wet dust collectors showing the valves at the bottom of the cyclone cones. These collectors are made of 1/4 in. steel plate electrically welded.

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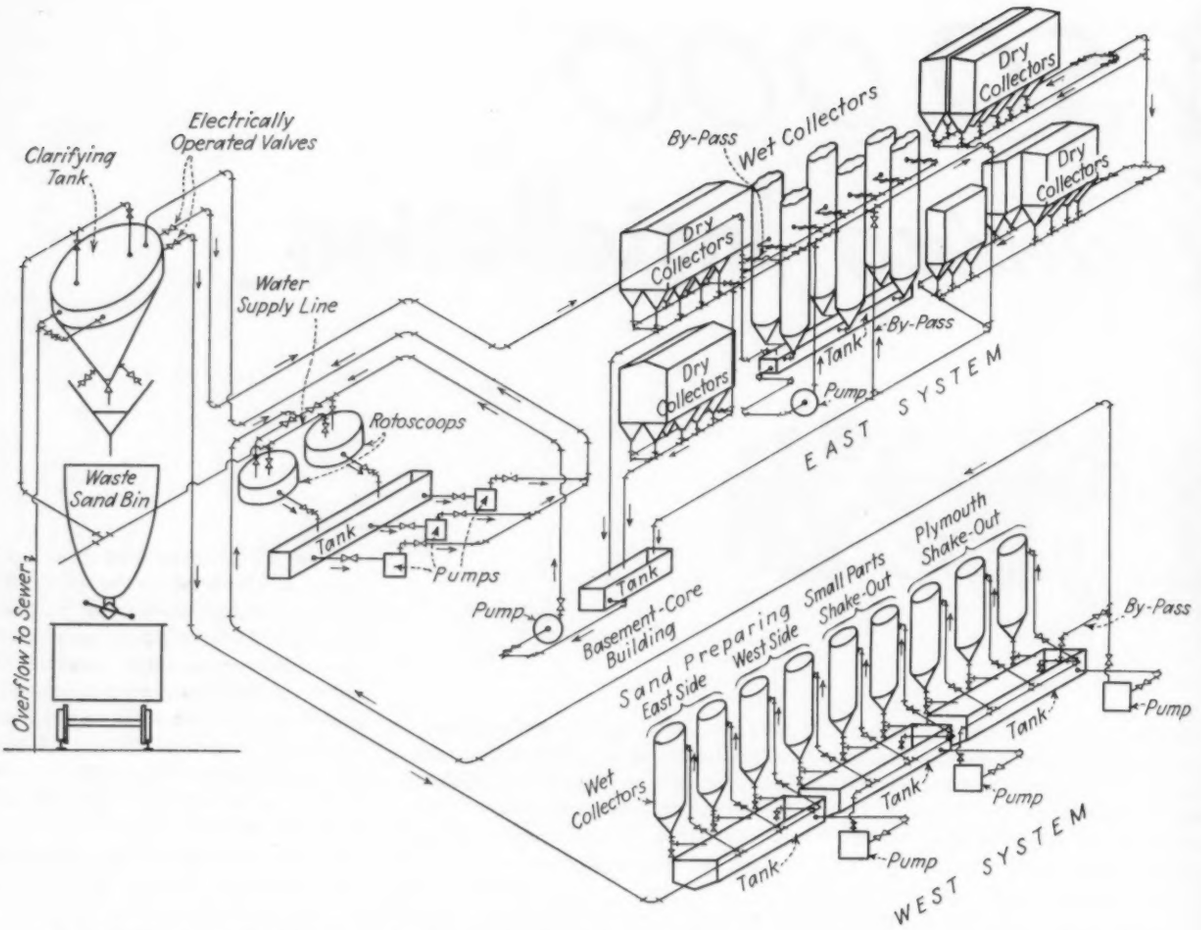
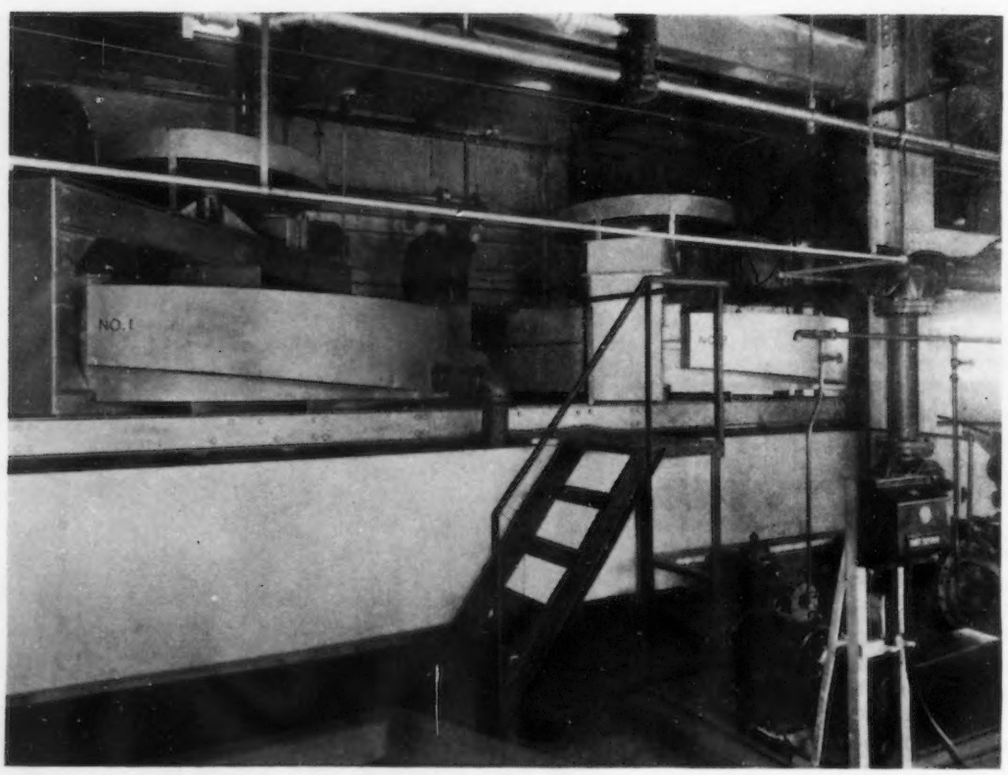



GENERAL plan of the Dodge foundry air-cleaning installation, showing the east and west dust collecting systems and the de-watering apparatus.

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THE de-watering equipment for recovering sand and dirt from the air-cleaning system. The refuse from both wet and dry dust collectors is pumped from various points to the central de-watering system.

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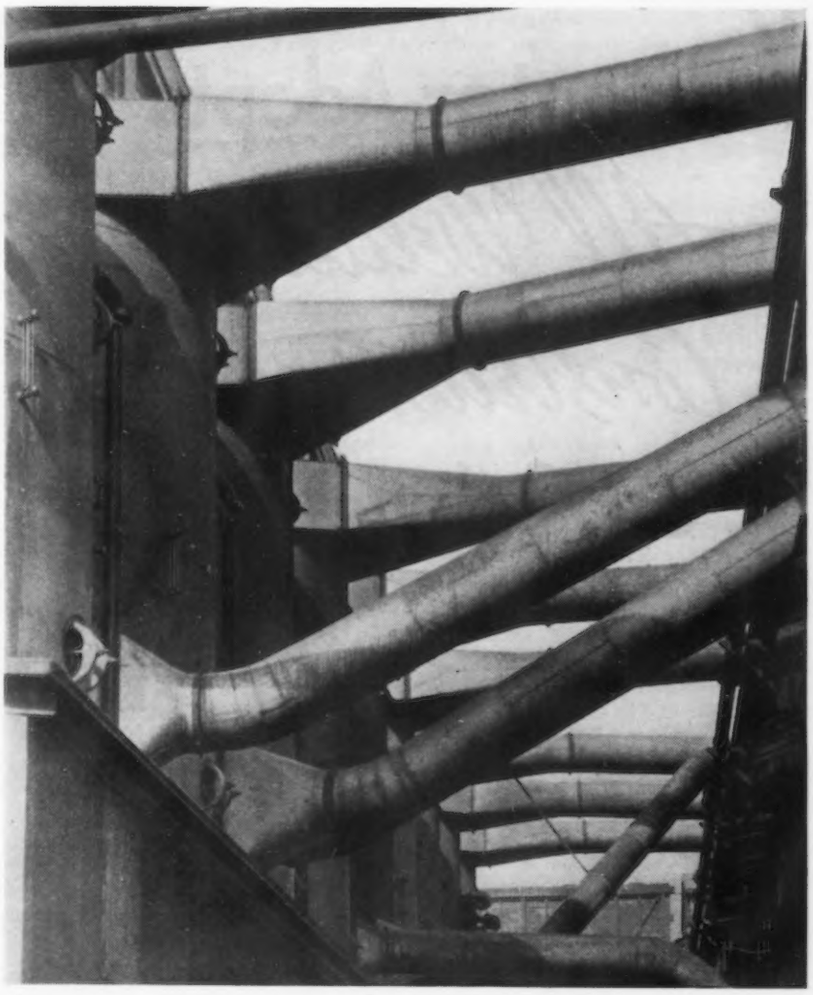
hopper passes out through an elbow connection into the central drain trough under the battery of washers. A valve is provided at the bottom for flushing.

The dirty water contains approximately 10 per cent of suspended matter by weight. Drainage from the cyclone is direct through a water seal, while the reservoir under the contacting tubes can be drained by use of a cock. These wet collectors are hooked up in batteries of three so that the drainage of the first group is pumped into the second group and thence into the third group. The third pump sends the dirty water to the central separating system.

Dewatering equipment has been installed for recovering the sand and dust from the dirty water. The wet refuse from this equipment is dumped on a belt conveyor. This conveyor discharges its load into a paddle mixer into which dry waste sand is also dumped bringing down the over-all moisture content so that the refuse can be handled by freight car.

Clean water from the dewatering equipment is recirculated through the system. About 25 gal. per min. of fresh water is supplied in order to keep down the scum which would interfere with the action.



OUTSIDE view of the wet dust collectors, showing the inlet ducts at the bottom and the outlet ducts at the top.

NEW uses are being found every day for sheet metal and now comes the Goodhart Memorial Co., of Belleville, Ill., which has recently developed a complete line of headstones and grave markers made of porcelain enameled 12 gage Armco Ingot Iron. The exterior of the marker is given six coats of porcelain enamel, while the interior receives two. After its being treated in this manner, there is no exposed metal, making it impossible for it to rust or corrode. The enamel itself is guaranteed not to peel, discolor, rust or tarnish. The markers may be transported and handled easily because of their relatively light weight, and the price is much lower than the conventional memorial.

# Kelvinator Adopts *All Welded Construction* on Cabinets

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MANY techniques that have been developed for welding thin gage steel for automobile bodies are now being applied in the electric refrigeration industry. At the Grand Rapids plant of the Kelvinator Corp., where both Kelvinator and Leonard cabinets are made, there has recently been installed some high-speed welding equipment that is comparable with the latest practice in the automotive industry. By adopting a 100 per cent welded shell, it is possible to construct a cabinet with graceful, flowing curves and one that provides maximum dependable performance by excluding air and its attendant moisture content from the interior of the cabinet walls. The one-piece welded shell forms a structural backbone for the cabinet and makes unnecessary any frame of wood or other composite structure, permitting use of a maximum of insulation in place of a wood frame, giving a much better insulated cabinet. Formerly the cabinets were bolted together.

There are a number of varied types of welding operations in joining the various panel stampings, which make up the complete cabinet. In the "K" line, for example, end panel stampings are flash welded to the top panel, a front center cross panel is projection welded in place, the bottom bulk head panel is projection welded at its four flanged edges to the sides of the shell, while an automatic multiple spot welding machine attaches the back panel to the shell. The base panel assembly (of four separate stampings) is gun welded to the bottom flanges of the upper-shell. Other types of cabinets use projection welding in place of flash welding.

In general, because projection welds require but little metal finish, they are used at most of the main junction points such as bulkheads and cross panels. Gun welds, single and progressive spot welds cause indentations in the metal surface and their utility, therefore, is limited to the backs and bases of the cabinets.

In fabricating Kelvinator's cabinet interior or food chamber, the roller seam weld is used to obtain clean, smooth seams, free from burn marks, allowing better porcelaining on the more uniformly flat surfaces obtainable. By this method chamber seams are heated at the exact line of the weld, preventing any buckling which would occur if the heat were not controlled. Nor are weld strains left in the metal to cause buckling and distortion when it is later subjected to the high heat of the porcelain enameling furnaces.

Throughout all of the welding processes, accuracy in holding exact dimensions is practically automatic, each operation being controlled by jigs and fixtures predetermining the position of one part with respect to another. When completed, the cabinet is a compact, solid shell which readily lends itself to the subsequent metal finishing process, painting and assembly operations. Initial cost of installing necessary welding equipment to produce the one-piece welded shell is justified and offset by the greatly increased strength and product uniformity, assuring a maximum of performance at the lowest cost of maintenance and operation in the finished electric

refrigerator. Furthermore, the welding technique has made possible more pleasing contours, a sales asset that also offsets any increase in cost of production.

In fabricating food chambers the back and two sides are formed in one U-shaped piece and the first operation in the assembly is to weld a top and bottom piece so as to form an open-ended chamber. This operation is performed in two steps. In the first, top and bottom stampings are seam-welded to the back side of the chamber wall. In the second step, the sides are welded to the top and bottom. To do this two handlings are required in the second set-up.

An unusual seam welding machine, shown in Fig. 1, has been developed by the Federal Machine & Welder Co. in cooperation with the Kelvinator Corp. Chief features are two movable carriages on which the welding jigs are mounted. Each carriage has four wheels running on a track and longitudinal movement is by hydraulic plungers. The work itself is clamped pneumatically in the fixture so that the edges overlap 1/16 in. The seam welding equipment, which is composed of two rollers, itself travels on an overhead track through a motor-driven pinion and rack. The capacity of the machine is 225 kva. and average output is 50 chambers an hour, with average length of weld 22 in.

A notable design feature of this unit is the fact that the secondary transformer terminals are connected by flexible brush copper busses to each wheel and the circuit is completed through the work. The circuit is formed between the work and the backing dies which are bridged by a flexible copper jumper. In other words, the two welding wheels are in series, rather than in parallel. An arrangement of this kind permits adjustment of rollers and backing dies to accommodate various widths of chambers.

Three operators are required for the machine. At both ends there is an operator to load and unload the work and at the side sits a man who controls the hydraulic valves for carriage operation and the push button switch which controls the seam welder travel. In operation, one carriage is first loaded and advanced to the work position. The welding rollers then automatically descend and the seam welding operation begins. At the completion of travel, the roller is raised and the work carriage returns to the unloading position. In the meantime, partially welded sheet metal assemblies have been placed in the second carriage and clamped in position and await only the action of a hydraulic valve to advance the whole assembly to the work position. A roller conveyor carries the work from the first position to the second and in order to facilitate loading in the second position, the corners are either

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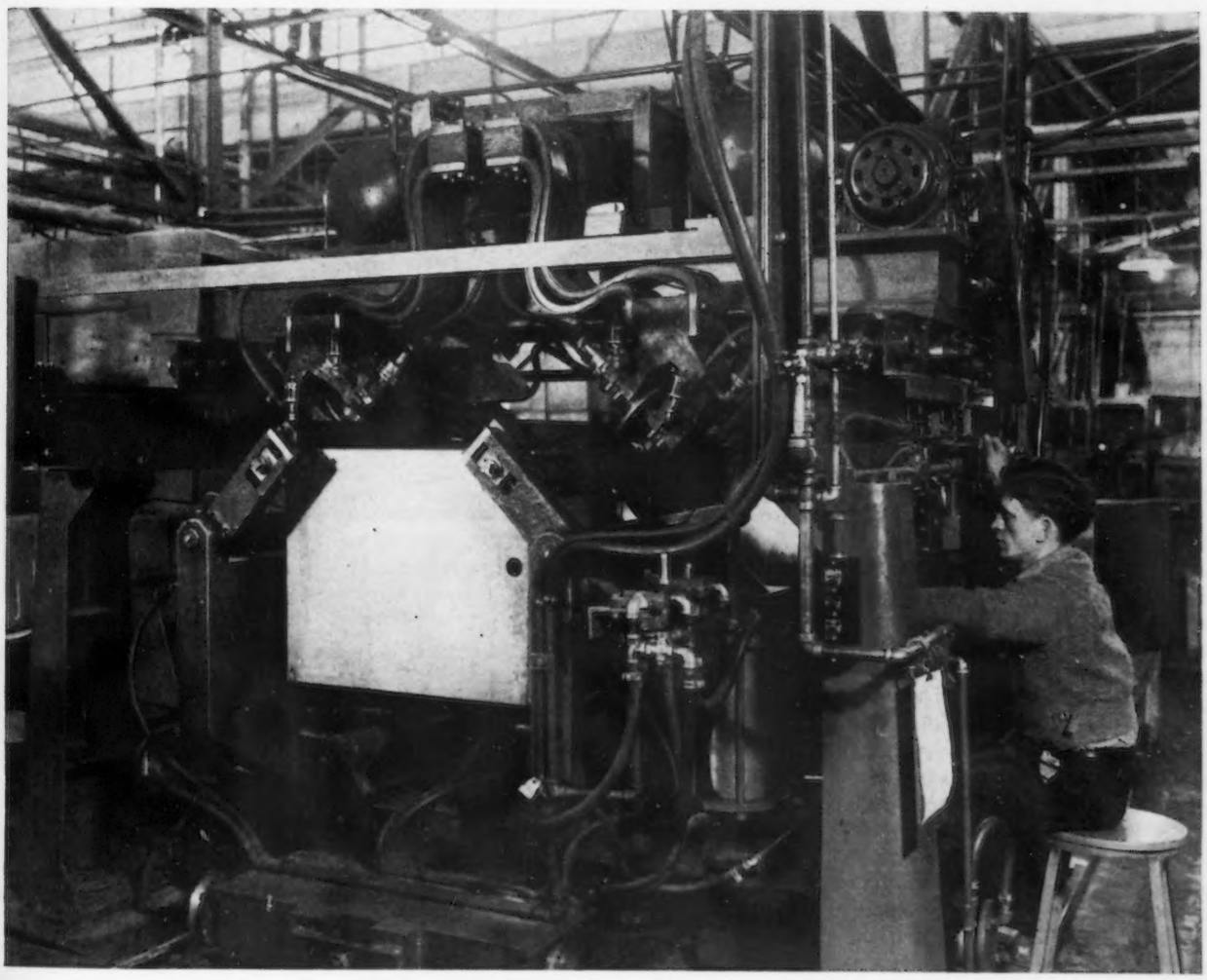
FIG. 1

AUTOMATIC seam welding of food compartments on 45-deg. corners is carried on in a machine having moveable work-holding carriages that can be withdrawn for loading and unloading.



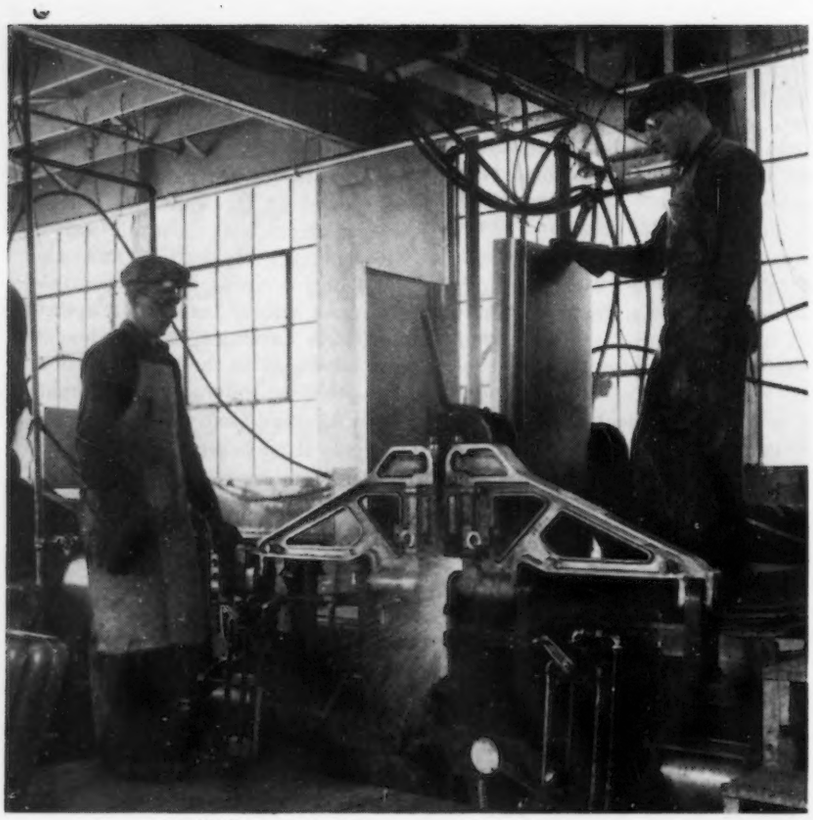


FIG. 2

ABOVE

SIDE panels being flash-welded to the top panel in an inverted position. Heat-treated aluminum latches facilitate locking the clamp bars in position.

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spot or gas welded in position. After a final seam welding operation, the work is returned on a belt conveyor from which it is taken off for subsequent operations.

This particular seam welding operation is a highly important one, since any defective welds will show up in the porcelain enameling operation. If the welding pressure is not right, there may be gas inclusions which later show up as bubbles in the finish. It is essential to keep the wheels properly dressed as mushroomed edges have a marked effect on the welding current and heat. It is equally important to gas weld the corners properly, since this is a job that the seam welder rollers obviously cannot do. Actually, rejections from this source are very low compared with those obtained when the entire box was gas welded.

These seam welds must also be strong enough to withstand subsequent forming or beading operations on the four sides and corners on a horning press. There are also some hand finishing operations on the piece, including hammering the corners and crowning of the top and sides to give a good appearance after enameling. Any roughness is cleaned up by hand or rotary files before the work goes to the pickling tanks prior to receiving the ground coat.

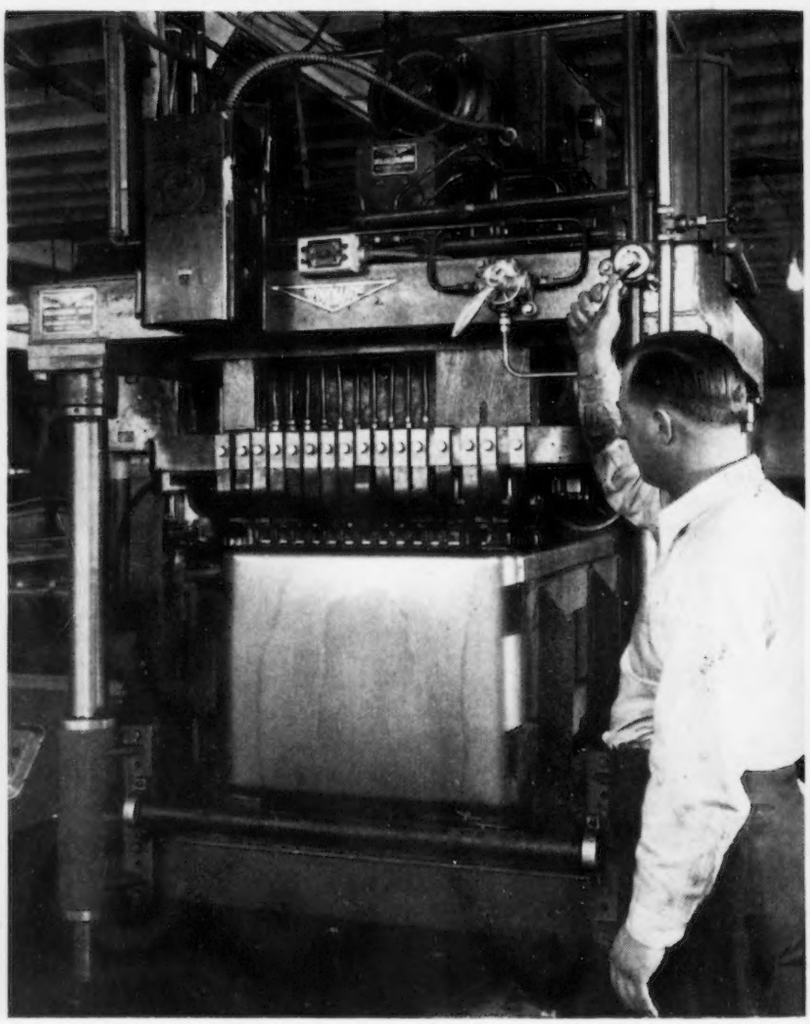
In forming the outside box or case, the first operation is to flash weld the two end panels to the top, one side at a time, in two separate machine setups, Fig. 2. The case is in an inverted position and the stampings are clamped pneumatically, as in automotive practice, in a pair of Federal flash welders

o o o

FIG. 3

BELOW

APPROXIMATELY eighty individual spot welds are made successively in attaching the back panel to the side and top panels in this "Hydromatic" unit. The work-holding table is raised by air pressure, whereas the welding tips are depressed under hydraulic pressure.



rated at 200 kva. In resistance flash welding the metal sheets are "butted" edge to edge in the welding machine without overlapping. In fact, using thin gage metal such as Nos. 18 and 20 gage in these cabinets, it is essential that the work be accurately alined and hence substantial dies and work clamps are called for. In this particular set-up the center section or top is first placed in the formed dies with the welding edge against a gage, which is later withdrawn. Clamping arms are first lowered, however, and large heat-treated aluminum latches are thrown into clamping position. The side member is similarly placed in position and clamped by toggle action. Operation of the welder is entirely automatic including the flashing and upsetting of the weld edge, cutting off the welding current and stopping the motor. Cycle time is 5 to 7 sec. Output is 55 cases an hour.

For another model, projection welding on a Swift machine is being employed. The choice between these two methods lies largely in questions of ultimate cost versus quality. A neater weld is formed by flashing the sheets together, since rounded corners are permissible, but a great deal more time is required to clean up the flash by cup and disk grinding as well as hand filing. A good projection weld requires practically no finishing, since the abutting piece on the outside is a flat section of copper alloy which leaves no indentation on the surface of the metal. On the other hand, only a small percentage of the metal is actually welded, compared with 100 per cent for a flash weld, but full sheet strength is developed.

Another machine which has found application heretofore principally in automotive plants is that of multiple spot welding the back panel to the side panels and top. This operation is performed in a "Hydromatic" welder, Fig. 3, which in reality is a progressive, multiple spot-welding machine. In this instance, indentations left by the welding electrode tips are unimportant. In this particular unit approximately 80 individual welds are made successively in a period of about 13 sec. Output is approximately 90 units an hour. The table on which the fixture is clamped is advanced upward to the welding position through air pressure.

In a machine of this kind each individual electrode is advanced through hydraulic plunger action, using oil under 500 lb. per sq. in. pressure. A multiple port valve is employed in which only one port is uncovered at a time, which means that only one electrode can be operating at any one moment with the full power of the 50 kva. transformer going through it. Flexibility of control is obtained by means of an air driven motor which drives both the hydraulic valve mechanism and also the electric timer which governs the duration of the welding current.

As in other machines in the line, flexibility is paramount. Altogether, there are two welding lines and 14 distinct models are run over them. Part of the redesign of the cabinet called for a standardization of construction with respect to welded seams so that a maximum of welds could be handled over the same equipment. When production is high, the average length of run is 1500 to 1600 cases, but when production is fall-

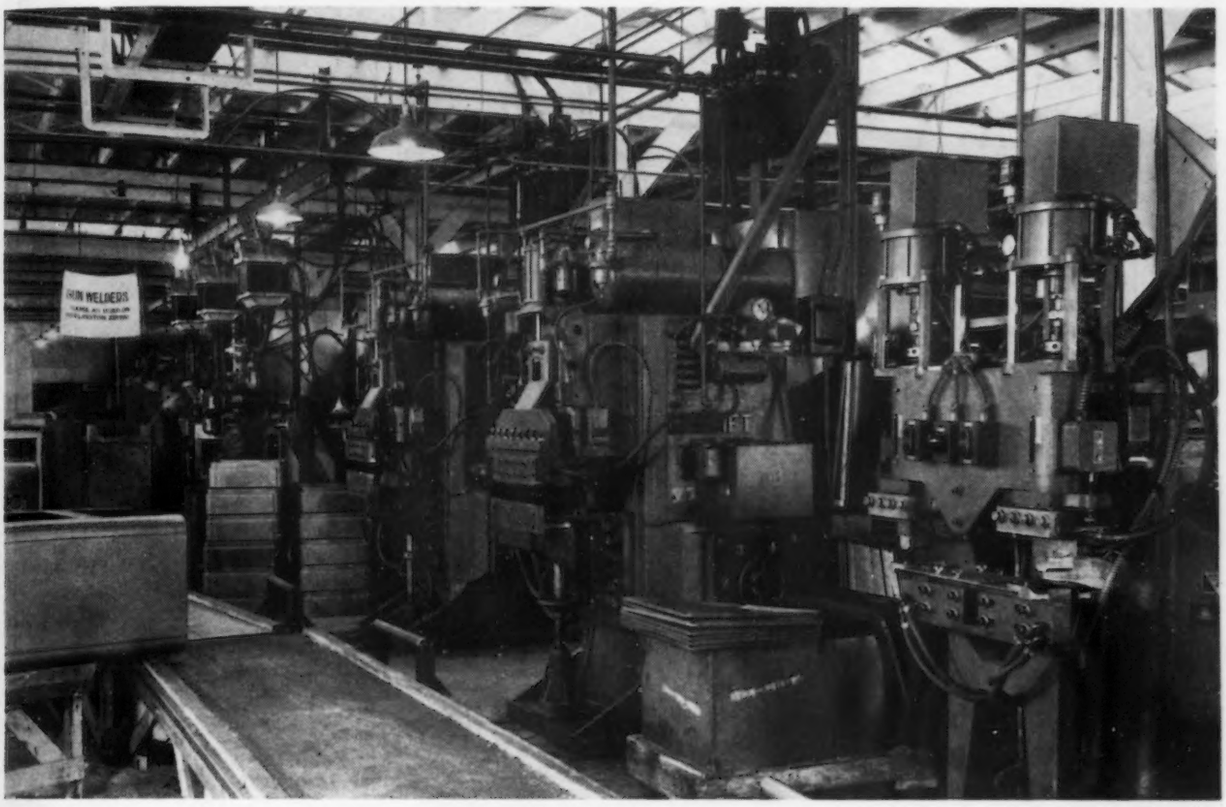



FIG. 4

BATTERY of Swift projection welders used progressively on Kelvinator cases. Three of the six Federal gun welders may be seen in the background.

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ing off, the run must be made on much lower units; hence the change-over time is extremely important. In the example of the Hydromatic welder, it is possible to vary the number of welding tips in use and to change the width between the banks of welds down each side. The timer must be reset and the air motor speed changed. A rather simple fixture for holding the work is employed and this need only be shifted sidewise to accommodate different widths of box.

Just as great a flexibility is required in the projection welders, Fig. 4, which comprise the majority of the group. Here it is largely a matter of changing electrode die plates usually fastened to the machine by countersunk capscrews.

Referring again to the model K cabinet, after the shell leaves the Hydromatic welder, it goes to an 80 kva. Swift projection welder where the center cross rail is attached to each side. The side panels are notched to receive the cross rail which is indented for four spots on each side. Control of the cycle is fully automatic, including timing of the welding current and its light pressure followed by a much heavier follow-up squeeze pressure. A very nice adjustment is required in the work pressure to get a proper weld. Too light a pressure burns the work; too heavy causes a defective weld since the projections are flattened and the current is distributed over too wide an area.

Similar automatic cycle control is applied on the next two Swift projection welders, much heavier machines rated at 400 kva., one of which is illustrated in Fig. 5. In the first set-up the bottom bulkhead is attached to the back and front of the case and in the second to the side panels. From 16 to 20 spots are welded at a time, depending upon the size of the cabinet. Welding and squeeze pressure is

FIG. 6

AT RIGHT

THIS double-head projection welder attaches the front top panel to the sides of a Leonard case. A relay panel allows first one and then the other head to operate. Air controlled collapsible dies permit withdrawal of the work after welding.

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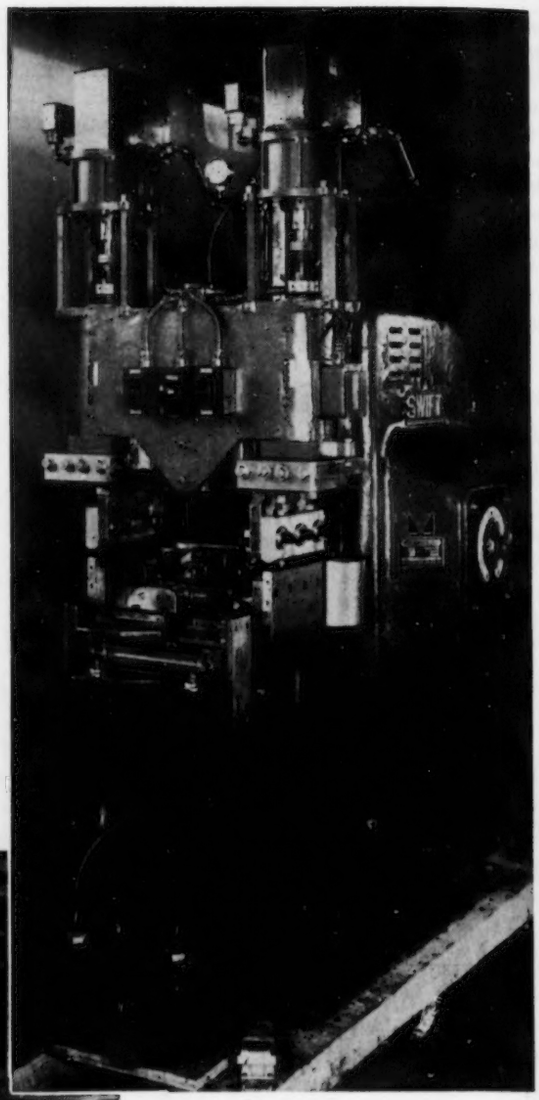
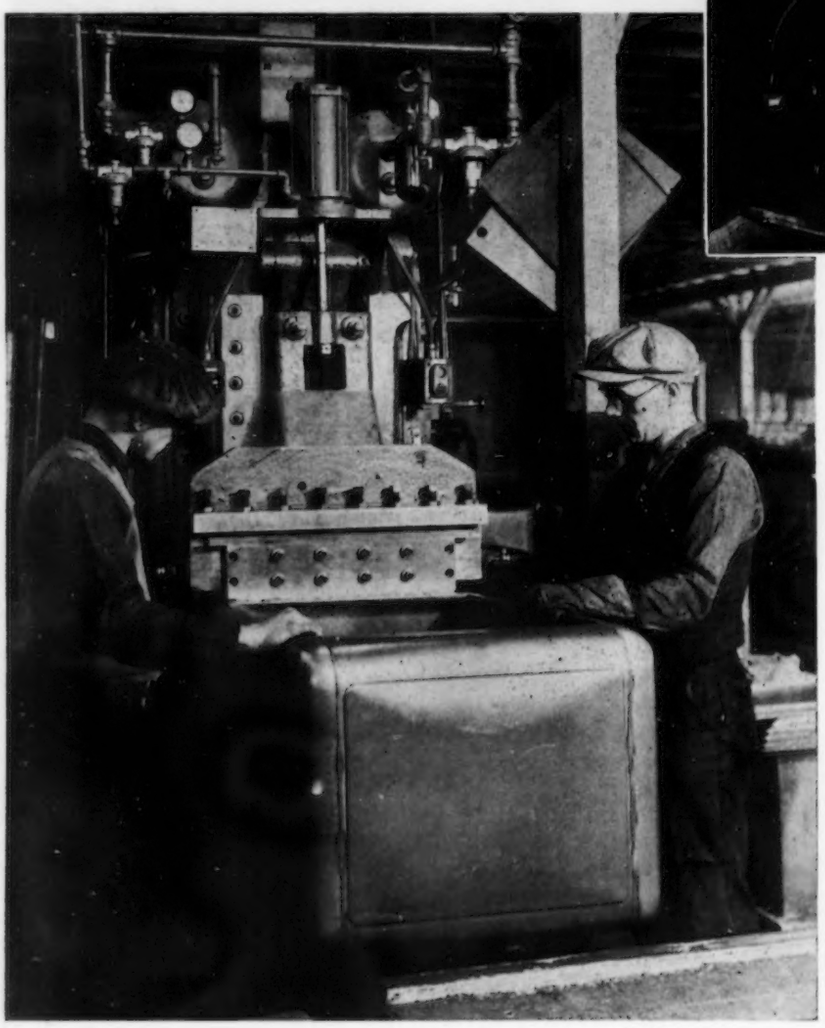
FIG. 5

BELOW

TWENTY spot welds are made at once in this 400 kva. projection welder shown joining the bottom bulkhead to the center front cross panel. Low and high pressure air receivers on top of the machine are used in connection with automatically controlled valves to give the desired welding and subsequent squeeze pressures.





applied through an air ram in conjunction with a toggle mechanism having a 20:1 ratio. On top of the machine are two air receivers, one low pressure, the other high, and solenoid actuated air valves control their output to the ram. Welding time ranges between 20 to 40 cycles and is automatically controlled by a vacuum tube relay.

In another Swift projection welder used for Leonard cases, in which the unit is at the top, the front top panel is spotted to the sides in a double-headed machine in which first one side and then the other is welded, Fig. 6. A relay panel controls this operation so that the full electric load is concentrated in one set of welder dies, and the transformer capacity is held down to 150 kva. Because of the nature of the work, air controlled collapsible welding dies are employed in order to permit the assembly to be withdrawn after the welds are completed. These die air valves are treadle operated. Welding and squeezing pressure is also applied pneumatically, with the control entirely automatic by push button and relay panel.

Projection welding is also employed for assembling the four stampings that go to make up the base for the "K" series. Spot welders are used to attach a small stamping known as a float panel to the back panel and a special spot welder with deep horn die supplements the Hydromatic welder at peak load.

Altogether there are six Federal gun welders, three in each line, used to attach the base assembly to the shell. These operations are performed on inside flanged edges so that the question of appearance does not enter, and weld indentation is of no concern.

As can be seen in Fig. 7, the cabinet is inverted and is held by hand in a simple supporting fixture so that there is no loss of time in locating the work. About 60 spot welds are made in each assembly and the output is 90 jobs an hour.

Gun welder practice follows that of the automotive industry. Transformers of 50 kva. capacity are suspended overhead on monorails and both the cables and the welding tips are water cooled. The gun itself is counterbalanced by a spring-loaded reel and cable. Combination air and electric control is employed, timed automatically to produce 120-150 spots a minute. A good consistent weld of full strength is the main consideration. These particular welds are called upon to do severer duty than any other welds in the case, not when the refrigerator is in service, but when it is in transit. In shipment to the assembly plant in Detroit, where the units are installed and only, it is necessary to ding up, disk grind, hand file and buff. On the flash welded cases, trimming of the flash with a vitrified cup wheel is first necessary, and the disk grinding, hand filing and buffing are obviously more time consuming. All power tools are of the portable high-frequency type and

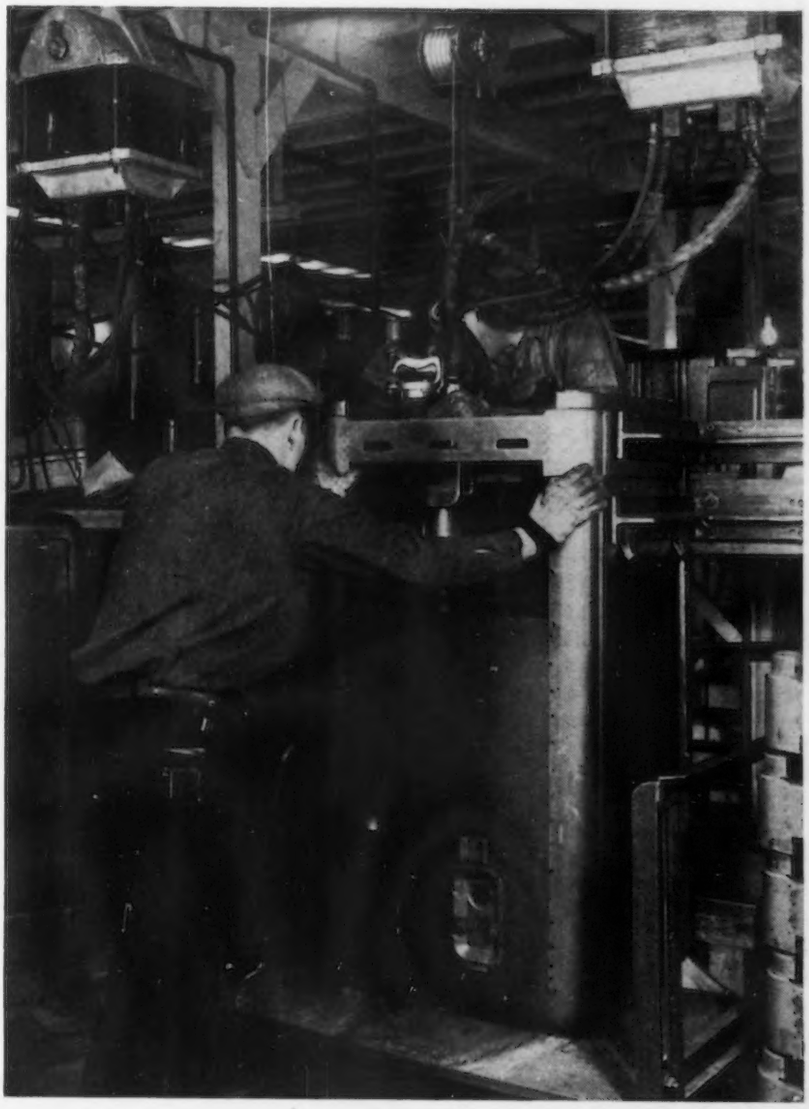


FIG. 7

GUN welding bases to inverted cabinets at the rate of 90 an hour. Automatic timers and water-cooled cables and electrodes permit up to 150 spot welds a minute to be made.

in subsequent shipment to dealers, the cabinet is bolted to a skid base on which the crate is built. Inertia effects in freight cars are sufficient occasionally to pull out the feet bolts, but the gun welds have never failed.

Metal finishing operations vary according to the type of weld used. On cabinets assembled on visible portions by projection welding are counter-balanced by cable and spring-loaded reel. Work is pushed by hand between the various finishing operations until it reaches the final inspection and touch-up. From here the cabinets are hung on an overhead monorail conveyor which takes them through steam cleaner, spray bonderizing chambers, rinse and dry, then to the paint shop for the synthetic enamel finish.

# *Bonneville* Sets Pacific Coast

## *1-The Market*

By EDWIN T. HODGE

*Consulting Geologist—North Pacific Division, U. S. Engineers*

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BONNEVILLE Dam, Oregon, will be completed sometime in 1937. At that time there will be made available from two units 640,356,000 kw-hr. a year at an 85 per cent load factor. The foundation is laid for four additional units, providing ultimately at the same load factor 1,578,552,000 kw-hr. a year.

At the present time no prospective purchasers for this new power are definitely known. Three different methods of disposing of the power are being agitated: (1) cheap power to farmers and similar consumers, (2) wide distribution by a tie-in with Boulder and Grand Coulee dams and (3) sale to large electro chemical and metallurgical industries located near Bonneville. In the belief that the latter course would give the greatest benefits to the largest number of citizens, a study was made and a report issued titled "Available Raw Materials for a Pacific Coast Iron Industry," under the direction of the U. S. Engineers. It is published in four volumes, contains over 1000 pages and may be purchased for $5.00 from the U. S. Engineers, 523 Pittock Block, Portland, Oregon. This paper is a review of the salient features of the report.

The report deals with the quality, quantity and delivered cost of the

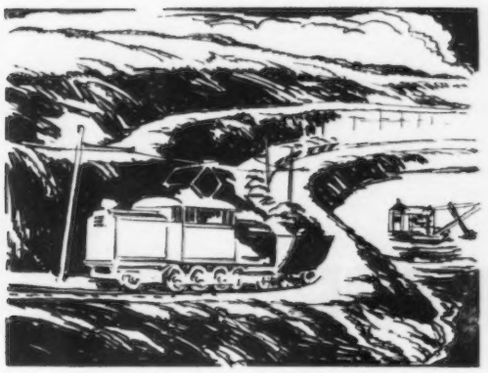
COMPLETION of Bonneville between Oregon and Washing will immediately be made avail kw.-hr. per year and at a later date tric power.

The prospective availability of Boulder Dam and Grand Coulee prospective power demands are more than a fraction of the total, complete an elaborate survey of territory. This survey, made under points to the feasibility of a Pacific employing electric smelting, which Coast ores.

For the benefit of our readers, articles abstracting the 1000 page first article deals with the market Coast area. Subsequent articles of raw materials.

# the Stage for a *Iron Industry*

## *Possibilities*



Dam, on the Columbia River
ton, is scheduled for 1937. There
able at that time, some 650 million
close to 900 million more of elec-

this power, together with that of
and the fact that present and
entirely inadequate to consume
has caused the U. S. Engineers to
raw material resources in this
the supervision of the author,
Coast iron producing industry
is particularly suited to Pacific

Mr. Hodge has prepared a series of
report of the U. S. Engineers. The
for iron and steel products in the
deal with availability and cost

raw mineral materials at Bonneville for use in iron smelting. Foreign and domestic sources are considered and much attention is given to well advertised deposits and to a large number of almost unknown deposits in order to show their place in the economic picture.

Two worthy investigations as to the feasibility of an iron smelting industry by blast furnace and two minor studies on the electric furnace have been made. These studies found that:

(1) The magnetic ore is unsuited to blast furnace practice and is located a long distance from a source of good coke.

(2) Electric power costs $25.00 a hp. year.

(3) An excellent metallurgical coke is obtainable at Fernie but it lies on the east side of the Rocky Mountains. The other cokes are high in ash and sulphur and are structurally weak. The British Columbian coals, also, are always subject to tariff interferences. The coke was unsuited for blast furnace use and required a 25 per cent over consumption. Its poor strength required that the coke be used close to its place of production.

In view of the fact that a ferro electric smelting industry established at Bonneville would solve its market problem, it is pertinent to note that:

(1) The above reports on feasibility were old and incomplete.

(2) No survey of the supply of raw minerals for the electric smelt-

(CONTINUED ON PAGE 100)

# IMPROVEMENTS IN PRODUCTION A

## Thermocouple Lag Eliminated In New Gas Fired Furnace

"CYCLONE" gas fired tempering furnaces have been tested and are now offered commercially by Lindberg Engineering Co., 221 North Union Park, Chicago. At a location where 1 cent a kilowatt electricity and 800 B.t.u. gas at 38 cents are available the latter gives the lower operating cost.

The accompanying diagram shows the essential features of construction of the new furnace. A motor driven fan forces air at high velocity through the fan chamber which is interposed between the combustion chamber and the work chamber. Hot gases in the combustion chamber are mixed in proportions of approximately 1 to 50 with the rapidly circulating gases. This mixture passes up through the fan, enters the annular distribution duct at the top of the work chamber, and is drawn down through the work container, and back into the fan chamber. When the temperature, which is read by a pyrometer measuring the air as it leaves the fan, reaches control temperature, the burner is closed tightly by a motor operated valve.

Although the combustion chamber is on the suction side of the fan, circulation ceases entirely through the combustion chamber and a blast of air continues through the work chamber. The flue is on the suction side of the fan, which results in a slight back pressure that acts as a check valve. Gases escape from the flue only when the burner is on, which forces out the excess gases of combustion against the back pressure in the flue. Flue gases cannot

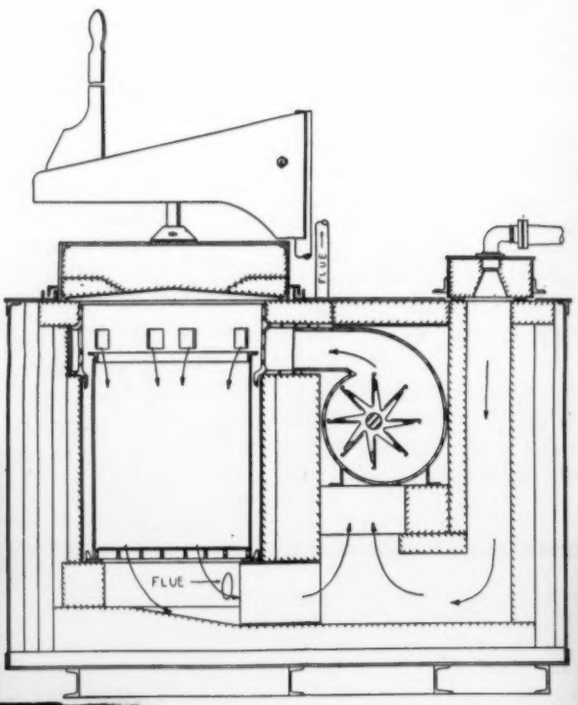
AT RIGHT

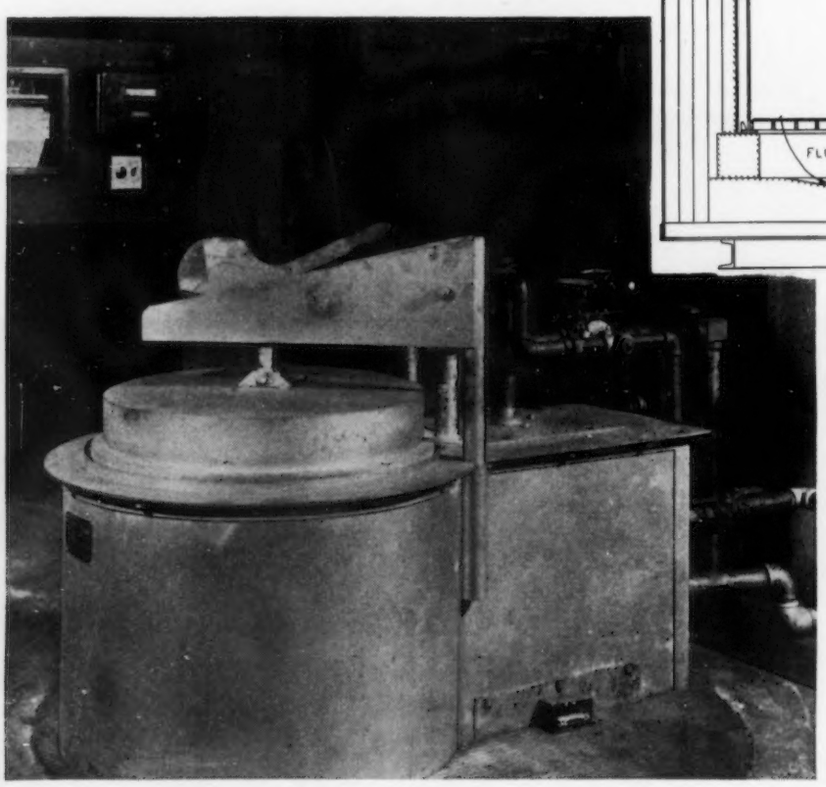
COMBUSTION chamber, fan space and work area are arranged to give compactness to this gas fired tempering unit.

o o o

BELOW

WHEN the circulating gas temperature reaches control temperature the burner is automatically cut off.



# AND SHOP EQUIPMENT...

leave the furnace until they have passed completely through the work.

Once the furnace goes on control, the automatic Lindberg control, which operates in conjunction with the pyrometer, reduces the heating rate to exactly equal the heat absorption of the furnace. This feature eliminates thermocouple lag, which is a major cause of overshooting.

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## Flight Conveyor Skeleton Links Initiate Mass Flow

REDLER conveyors (or elevators) a new development by Stephens-Adamson Mfg. Co., Aurora, Ill., convey and elevate in any direction, feed themselves measured loads, cannot be overloaded, and can discharge at any point. They are totally inclosed, are of low speed, and can be designed for large capacity of powdered and granular materials.

One of the important features is the patented conveying element, which when pulled through the conveyor casing causes the material to flow in a solid, undisturbed column. This conveying element consists of a series of detachable skeleton links with slender arms to reinforce the sides of the column of material in transit. Center-pull flights are used for all straight conveying and they can be used in conveyors of any length and the height to which they will elevate is limited only by the mechanical strength of the links.

Side-pull flights are designed for conveying horizontally and around horizontal bends. The conveying action is similar to that of the center-pull and the flights also float in the material when handling normal loads. Circular flights are used only in tubular elevators.

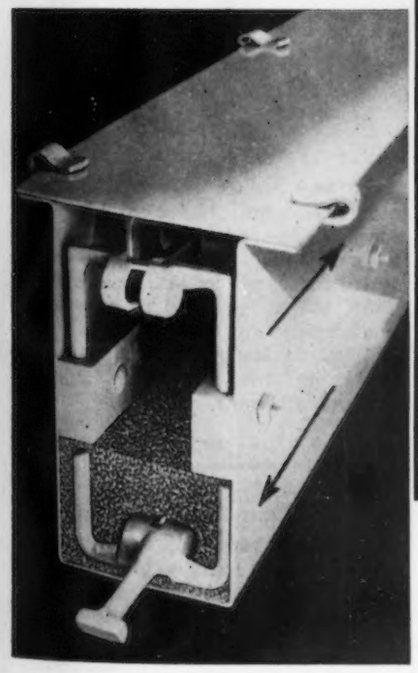
Casings are furnished wherever possible in standard sections. These are built with tight seams and points to insure dust-tight, weather-proof construction. Head tail and 90 deg. vertical-curve sections for conveyors and elevators are made in two styles—cast iron and steel. Sections for small and medium size conveyors are made of cast iron and steel. Larger sizes and special sections are made in steel. Tubular elevator head sections are of cast iron and steel, and boot sections, are of cast construction.

If the material is corrosive or chemically active, it is advisable to use: (1) cast iron casing throughout; (2) standard steel casing, galvanized; or (3) casing constructed of sheet brass, monel metal, stainless steel, aluminum or other resistant material. Materials heated to 300 deg. C. can be handled in standard steel or cast iron casing without difficulty. Higher temperatures require special construction of heat resistant steels. If the material handled must be kept warm or chilled, casings can be insulated.

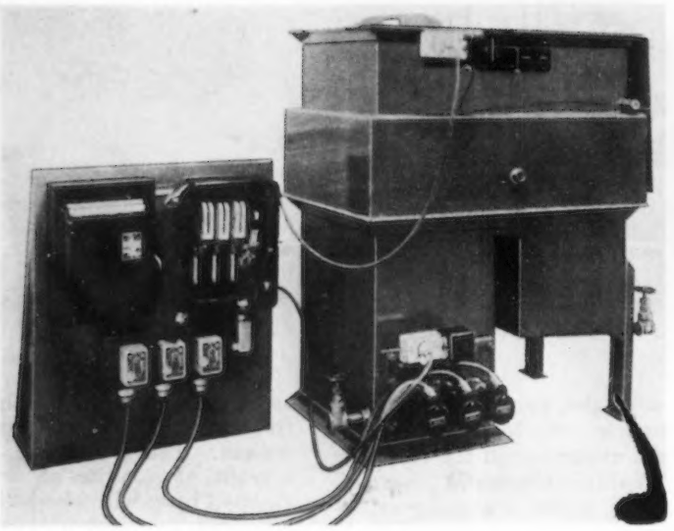
These units are built in standard sizes from small 3-in. conveyors to large units for handling hundreds of tons per hour.

BELOW

CROSS section of Redler conveyor showing loaded and return flights.



SHOWING method by which Redler flights are unhooked.



## Two-Dip Solvent Degreasing Machine

A NEW two-dip solvent degreasing machine, designated as size 624, is announced by Detroit Rex Products Co., 13005 Hillview Avenue, Detroit, Mich.

A water jacket type of condenser completely encircling the machine is employed and a solvent condensate collecting trough is located directly beneath the condenser. By this arrangement the solvent vapors are held within the machine and all of the pure solvent distillate is emptied directly into the second or rinse chamber, thus continuously renewing the rinse chamber with pure solvent. The work is usually handled manually in basket or on racks.

The machine is used for both immersion and vapor cleaning. The usual sequence of operations is to immerse the work in the boiling chamber, cool it in the clean solvent rinse, and finally suspend it for a few seconds in the pure solvent vapors over the boiling chamber. The work is removed clean and dry. This complete cycle of cleaning operations is accomplished in less than one minute.

Either "Perm-A-Clor" or "Triad," stabilized chlorinated solvent is used. These solvents are non-inflammable and non-explosive and have a solubility factor for oils and greases more than four times that of ordinary organic solvents. The solvents are used over and over with but slight maintenance.

The contamination resulting from the cleaning operation is removed from the solvent by periodic distillation within the machine. To facilitate this cleaning operation, there is an outlet from the solvent trough at one end.

The unit shown is arranged for electric heating, using three immersion type heaters. It is equipped with both top and bottom thermostat (expanded metal guard has been removed from top thermostat to show construction). The relay and switch equipment can either be placed on side of degreaser or mounted on a separate panel as shown.

## Improved $CO_2$ Meter

DEVELOPMENTS by Republic Flow Meters Co., 2240 Diversey Parkway, Chicago, in the measurement of $CO_2$ are incorporated in a new design of $CO_2$ meter. Experience gained in hundreds of plants over a period of many years has been utilized in building this improved analyzer.

The per cent $CO_2$ in the flue gas is measured by the Orsat method and the meter is built to duplicate, mechanically, this chemical analysis.

The meter is driven by a fractional hp. electric motor and requires no water for its operation. Stoppage in the gas line is avoided, as the instrument has a suction capable of drawing 14 in. of mercury. A large caustic tank holds sufficient potash for four to six months. Temperature variations do not affect meter readings. A filter in the gas line removes all $SO_2$ from the flue gas before it reaches the analyzer. A permanent, continuous, pen line record is inscribed which may be read directly in per cent $CO_2$. Arrangements of indicators and recorders may be made to fit any requirement. Related factors, such as steam flow, temperature, draft, pressure, etc., may be combined on one circular chart. Construction is rugged, with a minimum of moving parts.

## Portable Scale Features New Weight Indication

EXCEPT for the commodity or weighing platter, all working parts of a new weighing scale, Shadowgraph, announced by the Exact Weight Scale Co., Columbus, Ohio, are fully inclosed. A new principle in precision weighing is said to be involved in the design and to provide for the registering of exceptional travel per oz. of weight on the dial, at no sacrifice to speed of operation. Portability of the unit is featured as the design permits of accurate weighing out-of-level. Even or level weigh benches or foundations are not a necessity and all models are equipped with carrying handles. Rubber mountings eliminate

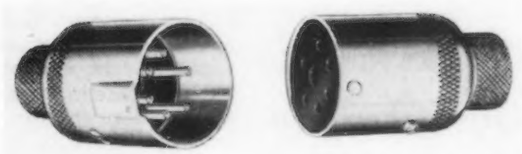
noise and reduce shock. Cabinets are aluminum hammered effect enamel. The indicating mechanism consists of a shadow cast upon a dial illuminated by standard autolamp bulbs. Ability to function consistently in dust-laden air is stressed by the makers as of particular interest for many industrial installations.

United Air Lines Transport Corp. has announced that it will sell $3,000,000 to $4,000,000 of new securities, proceeds to be used for the purchase of 20 Douglas twin-motor airplanes and other equipment to be delivered late next year.

## Mercury Switch Has Liquid Fill

FOR use on both hydraulically and mechanically-actuated machine tools, Durakool, Inc., Elkhart, Ind., is offering a new mercury switch having a metallic envelope and mercury-to-mercury contact. To the use of a liquid fill above the mercury is attributed elimination of hydrogen gas leakage or absorption, improved heat radiation, minimum operating angle, and unusually long life. Functionally the liquid fill assures uniformity of points of opening and closing the circuit, or repeat performance. This permits greater accuracy in calibrating the mechanism, the calibration remaining the same for the reason that the operating angle does not change with further use. The viscous liquid forms a stabilizing covering over the mercury bodies that prevents surging. Mechanical vibrations or shocks will cause no false contacts or interruptions. The limited mercury travel results in an almost balanced switch at all times.

The construction is further emphasized as eliminating fragile envelopes and limited inleads. Continued operation does not cause internal disintegration of the envelope nor absorption of the inert atmosphere. The metallic envelope is enclosed in a molded bakelite insulator and electrical clearances are such that when the switch is installed in wet places leakage or flash-over will not occur. The device will not rupture on sustained overloads, and it is stated that at rated loads the temperature rise is less than 20 deg. C.



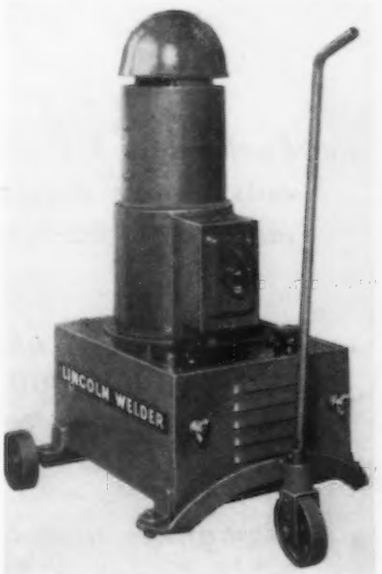
## Improved Electrical Connections

NEW six-pole, multiple-circuit plugs and receptacles, rated 10 amp. and 250 volts are being offered by the Pyle-National Co., 1334-58 North Kostner Avenue, Chicago. These are adaptable to a variety of uses such as for lighting and electric brake connections between highway trucks and trailers, for all types of portable sound equipment, for instrument circuits, thermo-couples, remote control circuits, etc.

Housings are heavy gage drawn steel, cadmium plated. The contacts, especially the male element, are fully protected by high grade bakelite insulation and the steel housings. Plugs can be inserted in only one position, insuring correct engagement and proper grounding. Male and female contacts are self-alining as they float in the insulation. A bayonet locking device prevents accidental separation, as a definite twist and a pull are required to move the plug. A substantial rubber-packed strain-relief cord clamp is provided to relieve strain on wires at contact terminals. This rubber-packed cord clamp also excludes dirt and moisture from the terminal connections.

## New Welder Features Burn-Out Protection

A NEW motor-driven, single operator type, arc welder for general fabrication and repair work is announced by the Lincoln Electric Co., Cleveland. The machine, designated as SA-150, has a rated current range of 45 to 200 amp., and features a variety of applications. These include sheet metal work, hard-facing of many types, pipe welding, cast iron repair, fit-up and auxiliary work in shops where heavy welding predominates, regular production welding involving steel, alloy and non-ferrous plates and shapes. It




can be used with either bare or shielded arc type electrodes.

At proper points, the machine is insulated with class B insulation, having no inflammable materials. The construction is said to permit sustained overloads and to insure against burn-outs. Electrodes as heavy as ¼ in. are used.

## Light-Weight Air Drill

A PNEUMATIC drill weighing 4½ lb. has been added to the Hercules line of the Buckeye Portable Tool Co., Dayton, Ohio. Drilling capacity is up to ¼ in. The length over all 12 in. and the speed is 2200 r.p.m. Starting and stopping is by a thumb-lock throttle. The device can be held in one hand. The design has been particularly developed for use in the fabrication of bus bodies, airplanes, refrigerator cabinets and similar work.

# THIS WEEK ON THE ASSEMBLY LINE

*. . . Packard and General Motors expansion plans outstanding developments in battle for 1937 automobile business.*

▫ ○ ○

*. . . Announcement of new Packard series coupled with $18,000,000 program; General Motors to build at Linden, N. J.*

▫ ○ ○

*. . . First of new models to appear shortly as automobile industry predicts a total of possibly 5,000,000 cars next year.*

○ ○ ○

*. . . New models may be priced slightly higher than 1936 cars, primarily because of increased labor costs.*

DETROIT, Sept. 1.—The introduction of a new Packard series, embodying four complete lines of motor cars produced as the culmination of a three-year, $18,000,000 plant expansion program, was the event most anticipated this week in Detroit. This opening gun in the battle for 1937 model business was due to be fired Sept. 5, after dealer meetings earlier in the week.

Although Packard was stepping up activity on the assembly lines, and Studebaker was similarly beginning volume operations on its 1937 models, the industry as a whole underwent another seasonal decline during the week ending Aug. 29. Ward's Automotive Reports placed output during that week at 59,237 units, compared with a revised total of 71,935 for the preceding week and approximately 52,395 for the comparative week in 1935.

The chief element in the decline, which was entirely along lines of seasonal expectations, was the completion of 1936 model production at Plymouth early in the week. Operating against the seasonal ebb, besides the renewed activity at Packard and Studebaker, was a moderate advance in production at Ford.

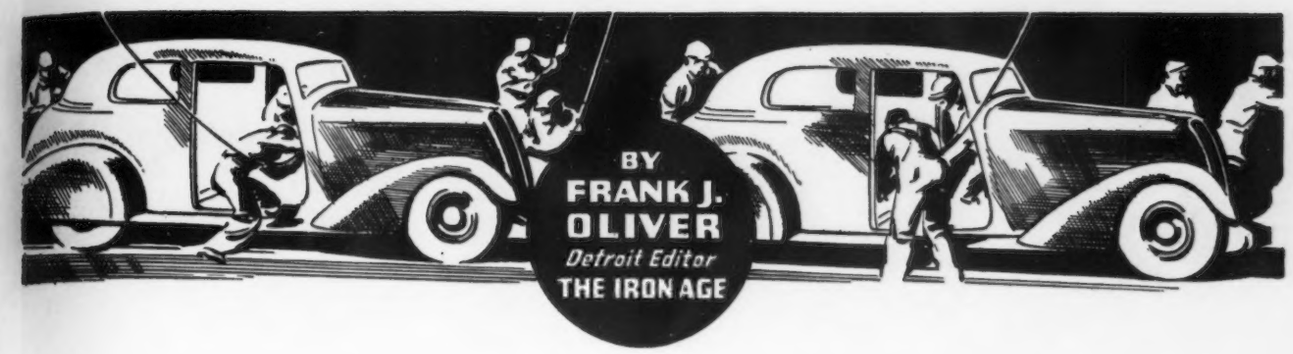
### Further Drop Expected

Immediately in prospect is a still further drop in output, although the figures certainly will not decline to the bottom levels which were seen during 1935. Chevrolet is winding up its current production, and Ford alone will be bearing the burden of turning out cars in large volume. The focal points of General Motors and Chrysler will be engaged in retooling for varying periods in September before their assembly lines are ready to resume; and the major producers among the independents, except the two now turning out 1937 models, are similarly engaged at this time in work preliminary to production.

The close correlation which the industry has maintained with respect to the state of its dealer stocks has resulted in a field condition which has rarely been so satisfactory, reports to the factories indicate. In virtually every case unit production at the plants has been halted or will be halted at just the point necessary to leave the dealers with clean floors when new car announcements are made. In a considerable number of dealer organizations there will be definite shortages in field stocks before the 1937 models go on sale.

### Truck Sales Active

Final sales figures for July, released by R. L. Polk & Co., disclose that trucks again had a banner month—the second best in their history. Total registrations




of trucks and commercial cars came to 63,695 units, surpassing by far the previous best July, in 1929, and coming close to the mark of last April, when an all-time record for any month of 64,961 deliveries was established.

Passenger cars continued their good showings of previous months, with 357,490 registrations compiled. This figure has been exceeded only twice in July, in 1926 and 1929. The passenger car total for the first seven months of the year is now 2,210,571, as compared with 1,747,114 for the same period in 1935.

General interest in this between-model period is attached to what the new cars will have to offer in the way of improvement and change. It is generally conceded that the 1937 models will be priced slightly higher than their 1936 predecessors, this increase being primarily due to the advancing costs of labor. However, such higher initial cost will be balanced, it is felt, by lower upkeep costs. Better gasoline mileage and lower oil consumption, among other things, have been goals which the industry has kept definitely in mind while going ahead with new body and engine designs.

Although there are not likely to be improvements as sensational as four-wheel brakes or synchro-mesh transmissions were in their days, there will be a considerable number of general changes, as well as quiet movement toward innovations shown last year which the public approved. The probability of automatic transmissions being more in evidence establishes them as beyond the experimental stage. Buick and Oldsmobile will probably offer one as optional equipment. More overdrives will be available. Hypoid gearing will be found in both Chrysler and General Motors rear axles in line with Packard practice. The tendency toward reducing the horsepower-weight ratio of engines will continue.

### Expect 5,000,000 Cars in 1937

Significant indeed were the expansion announcements of Packard and General Motors, and the completion of reorganization efforts at Willys-Overland, all of which were news during the past few days. Such announcements herald an indomitable belief—backed by millions of dollars—that the current expansion of sales and business within the industry is due to continue. On this basis, the new models which will be appearing from now through November should receive an even more enthusiastic reception than have their predecessors of this past year, and a better-than-five-million car goal in 1937 is extremely possible of achievement.

Packard's expansion operations have been of prime interest, both from a general and from an iron founding standpoint. To make possible the assembly of four complete lines of cars which will be priced from well below a thousand dollars to the uppermost brackets, Packard has completed revisions which permit more than doubling the productive capacity of the plant. Some 50 distinctive models will be built for 1937, from a new six-cylinder model which will go aggressively for business in the field above the very low price market, right up to the traditional 12-cylinder custom jobs. The cost of the plant changes making possible such varied production is in excess of $5,100,000.

Capacity in the foundry has been enlarged one and one-half times, making possible greater precision and improved working conditions. Four new cupolas have been installed for melting iron, each with a capacity of 12 tons per hr. Materials are handled directly from railroad cars into storage bins adjacent to the cupolas. A new system enables electrically operated charging cars to carry materials for the storage hoppers in exactly the right proportions directly into the cupolas. New molding machines and sand treating plants have been installed as well as an elaborate system of conveyers to carry work directly to the various stations where it is to be done, and then to the machine shop.

New types of broaching machines have been installed in the plant. Two of these operate together to finish top, bottom and main bearing cap seats of cylinder blocks in single operations. Packard officials assert that the work is far more accurate and the finish far better than has been obtainable previously. Time has been cut to a fraction of that required for milling.

Another machine broaches all the main bearing journals of a crankshaft at one operation, and is said to be the first of its kind ever built. Two giant presses are being added to the battery in the body stamping plant.

The Packard assembly lines themselves have been rearranged,

# THE OBSERVING EYE

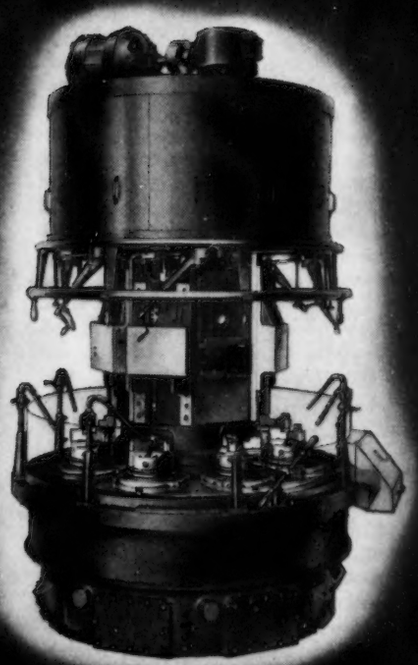
## *Studies FOR* FUTURE REFERENCE

OBSERVATION is an elementary and fundamental factor in Progressive plant operation. Therefore, the Observing Eye studies facts on plant equipment with a view towards more Profitable manufacturing.

The Observing Eye studies Bullard Engineering Estimates and sees Bullard Mult-Au-Matics in the light of Cost Saving Equipment. It Observes the Mult-Au-Matic in Profitable operation in competitive plants.

Send prints or samples of your Problem jobs to Bullard Engineers for Observation and Analysis. Let them submit Time and Cost Estimates for your Observation and Reference.

Mult-Au-Matics in sizes to meet your requirements for multiple operations of Turning, Boring, Facing, Drilling, Reaming, Threading, and other miscellaneous special operations.



TYPE "D"
MULT-AU-MATIC

**THE BULLARD COMPANY**
**BRIDGEPORT** **CONNECTICUT**

both in the body factory and in the main plant. Both novelty and efficiency are attributes of the new "merry-go-round" assembly sector for radiator and front fender units. Workmen do their assembly work on a large turntable while they ride past the points to which conveyers deliver materials to them.

### New General Motors Plant

The sizable sum which Packard has spent for these current improvements is matched by the cost of the new assembly plant which General Motors will build at Linden, N. J., for completion of Buick, Oldsmobile and Pontiac passenger cars. Construction will start at once. Completion is scheduled for December, and when fully equipped the plant will represent an outlay of about $5,575,000. Observers see in the announcement a continuation of the decentralization policy advocated by President Alfred P. Sloan, Jr., which has already been marked this year by the opening of a similar assembly plant at Los Angeles and by the erection of a new stamping plant outside of Grand Rapids.

The Linden plant will employ approximately 2000 persons and will have a normal capacity of 120,000 cars a year, of which one-third will be planned for export. Four buildings will be included. The main factory, 680 x 1080 ft. and two stories high in part, will have total floor space of 867,200 sq. ft. Body and chassis assemblies will be housed therein. There will also be a two-story office building, a 450-ft. loading dock, and a power house.

What with DeSoto's expansion program, announced some weeks ago, it would seem that the industry is considering expenditures in five-million-dollar units. De Soto's outlay will be about that much. It was understood here this week that the new plant of this growing Chrysler division will enable DeSoto to double its productive capacity for 1937. About 1750 more men will be added to the payroll than have been employed in the past, and with retooling scheduled on virtually every square inch of the 1936 models, it appears as though the company officials have big plans for the coming year. The motor will be built at the Chrysler Jefferson Avenue plant as before on a new line, but assembly operations will be carried on in the renovated Wyoming Avenue plant.

### Willys-Overland To Reorganize

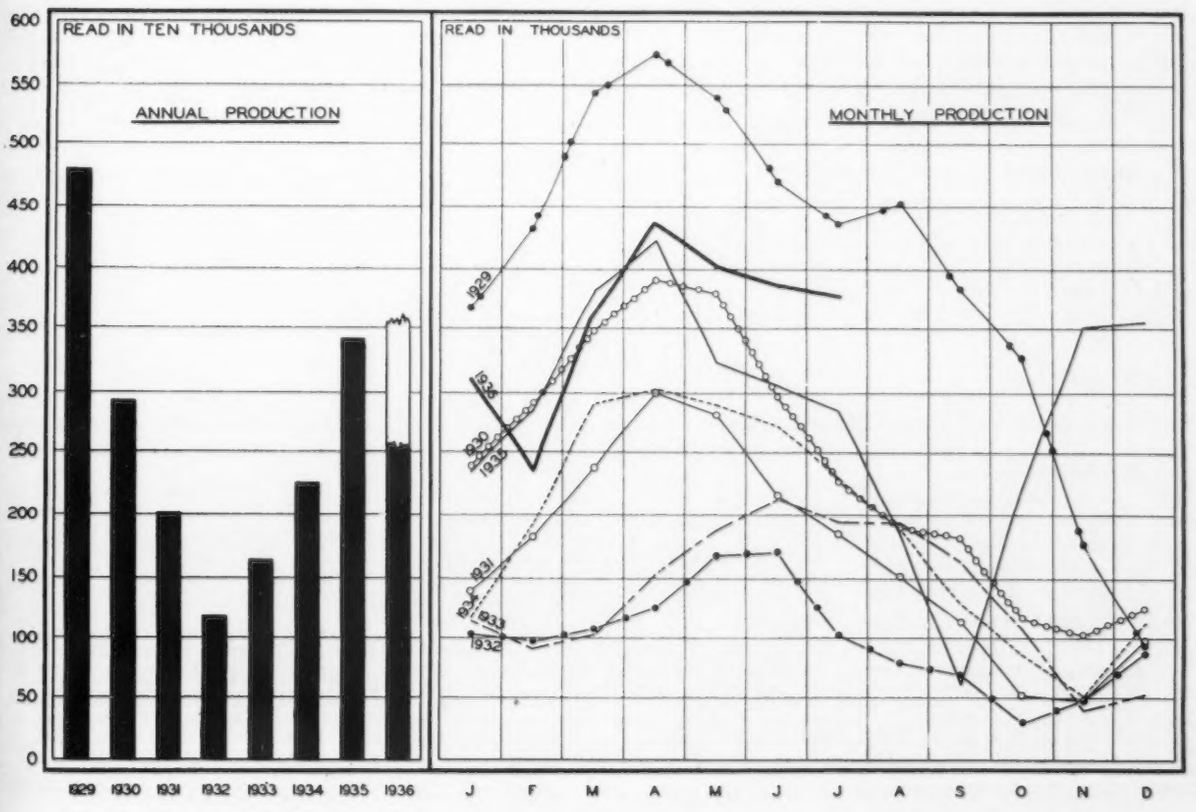
Toledo was again in the spotlight during the past few days when the Willys-Overland reorganization plan was approved. The new company will be known as Willys-Overland Motors, Inc., with Ward M. Canaday as chairman and David R. Wilson as president. President Wilson, who acted as trustee during the "77B" bankruptcy proceedings, said that he has already booked orders "from a picture" for 47,000 of the anticipated 70,000 new models. The schedule of operations while 1937 model production goes on calls for the employment of at least 5000 workmen during about 10 months of the year, and will result in a profit showing during 1937, Mr. Wilson said. Output of a full-size standard tread model will be under way later in the year, it was promised, with showings probably on Nov. 5.

Here and there in the industry: The second 10-day period of Au-

(CONCLUDED ON PAGE 88)

## Passenger Production in the United States and Canada

*(Note: 1936 figures corrected over those shown in the issue of August 27, 1936)*



# Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

| | July, 1936 | June, 1936 | July, 1935 | Seven Months, 1935 | Seven Months, 1936 |
|---|---|---|---|---|---|
| **Raw Materials:** | | | | | |
| Lake ore consumption (gross tons)[a] | 3,826,050 | *3,763,289 | 2,198,189 | 16,554,181 | 23,438,546 |
| Coke production (net tons)[b] | 3,828,548 | 3,787,711 | 2,612,411 | 19,635,159 | 25,123,848 |
| **Pig Iron:** | | | | | |
| Pig iron output—monthly (gross tons)[c] | 2,594,268 | 2,586,240 | 1,520,263 | 11,319,263 | 16,122,494 |
| Pig iron output—daily (gross tons)[c] | 83,686 | 86,208 | 49,041 | 53,393 | 75,690 |
| **Castings:** | | | | | |
| Malleable castings—production (net tons)[d] | 44,413 | 43,766 | 28,915 | 260,812 | 318,505 |
| Malleable castings—orders (net tons)[d] | 41,031 | 42,848 | 25,526 | 245,754 | 306,086 |
| Steel castings—production (net tons)[d] | ..... | 70,323 | 31,125 | 212,050 | ..... |
| Steel castings—orders (net tons)[d] | ..... | 94,345 | 34,570 | 216,940 | ..... |
| **Steel Ingots:** | | | | | |
| Steel ingot production—monthly (gross tons)[c] | 3,922,731 | 3,984,845 | 2,267,827 | 18,310,478 | 25,249,066 |
| Steel ingot production—daily (gross tons)[c] | 150,874 | 153,263 | 87,224 | 101,163 | 138,731 |
| Steel ingot production—per cent of capacity[c] | 68.74 | 69.83 | 39.40 | 45.70 | 63.21 |
| **Finished Steel:** | | | | | |
| Trackwork shipments (net tons)[c] | 5,916 | 6,507 | 4,054 | 25,629 | 40,508 |
| Steel rail orders (gross tons)[c] | 56,880 | 13,200 | 32,700 | 307,757 | 653,228 |
| Sheet steel sales (net tons)[e] | 192,873 | 261,439 | 206,313 | 1,351,298 | 1,400,959 |
| Sheet steel production (net tons)[e] | 217,651 | 210,448 | 145,505 | 1,371,398 | 1,492,309 |
| Fabricated shape orders (net tons)[e] | 188,053 | 128,520 | 65,957 | 584,947 | 938,724 |
| Fabricated shape shipments (net tons)[e] | 147,824 | 150,790 | 100,758 | 605,396 | 825,238 |
| Fabricated plate orders (net tons)[d] | 60,324 | 51,999 | 18,890 | 118,352 | 289,806 |
| Reinforcing bar awards (net tons)[c] | 45,245 | 14,505 | 12,045 | 122,550 | 221,840 |
| U. S. Steel Corpn. shipments (tons)[b] | 950,851 | 886,065 | 547,794 | 4,101,793 | 5,982,201 |
| Ohio River steel shipments (net tons)[f] | 110,495 | 109,455 | 77,464 | 486,112 | 576,116 |
| **Fabricated Products:** | | | | | |
| Automobile production, U. S. and Canada[k] | 451,474 | 470,887 | 350,054 | 2,723,227 | 3,058,089 |
| Construction contracts, 37 Eastern States[l] | $294,833,800 | $233,054,600 | $159,257,500 | $855,764,300 | $1,532,564,500 |
| Steel barrel shipments (number)[d] | 752,223 | 702,132 | 555,649 | 3,588,613 | 4,597,984 |
| Steel furniture shipments (dollars)[d] | $1,510,716 | $1,470,195 | $1,224,722 | $8,123,294 | $10,722,134 |
| Steel boiler orders (sq. ft.)[d] | ..... | 1,130,886 | 519,012 | 3,192,645 | ..... |
| Locomotive orders (number)[m] | 9 | 24 | 5 | 21 | 131 |
| Freight car orders (number)[m] | 4,469 | 4,320 | 5,000 | 7,083 | 31,023 |
| Machine tool index[n] | 150.1 | 128.8 | 119.8 | †94.7 | †132.6 |
| Foundry equipment index[o] | 159.6 | 141.4 | 94.0 | †98.3 | 155.4 |
| **Foreign Trade:** | | | | | |
| Total iron and steel imports (gross tons)[p] | ..... | 59,910 | 31,894 | 214,785 | ..... |
| Imports of pig iron (gross tons)[p] | ..... | 16,793 | 5,519 | 59,005 | ..... |
| Imports of all rolled steel (gross tons)[p] | ..... | 15,715 | 18,719 | 111,691 | ..... |
| Total iron and steel exports (gross tons)[p] | ..... | 294,951 | 296,802 | 1,892,736 | ..... |
| Exports of all rolled steel (gross tons)[p] | ..... | 100,303 | 83,171 | 494,484 | ..... |
| Exports of finished steel (gross tons)[p] | ..... | 89,287 | 68,129 | 433,234 | ..... |
| Exports of scrap (gross tons)[p] | ..... | 186,696 | 205,779 | 1,321,721 | ..... |
| **British Production:** | | | | | |
| British pig iron production (gross tons)[r] | 661,100 | 644,100 | 547,300 | 3,720,300 | 4,410,200 |
| British steel ingot production (gross tons)[r] | 974,100 | 965,900 | 803,300 | 5,604,500 | 6,718,300 |
| **Non-Ferrous Metals:** | | | | | |
| Lead production (net tons)[s] | 39,576 | 38,818 | 34,424 | 226,903 | *263 591 |
| Lead shipments (net tons)[s] | 38,996 | 37,736 | 34,575 | 230,007 | *253,473 |
| Zinc production (net tons)[t] | 45,553 | 44,947 | 35,120 | 244,996 | 309,285 |
| Zinc shipments (net tons)[t] | 41,891 | 41,654 | 32,306 | 247,278 | 294,378 |
| Deliveries of tin (gross tons)[r] | 7,120 | 7,795 | 5,290 | 33,680 | 44,140 |

‡ Three months' average. * Revised.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corp.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; [l] F. W. Dodge Corp.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.

Weekly Index of Rate Activity in Capital Goods, Adjusted for Seasonal Variation, 1925-27 Average = 100

### The Weekly Index Numbers of Capital Goods Activity

(1925-27 Average = 100)

| | | | |
|---|---|---|---|
| Last week | 87.2 | Same week 1933 | 53.4 |
| Preceding week | 90.8 | Same week 1932 | 32.2 |
| Same week last month | 85.5 | Same week 1931 | 57.0 |
| Same week 1935 | 65.9 | Same week 1930 | 83.8 |
| Same week 1934 | 39.9 | Same week 1929 | 120.1 |

ALTHOUGH there were a number of indications last week that the different lines of industrial activity had speeded up operations, on the whole a drop occurred in THE IRON AGE's combined capital goods index. The general level of activity receded 3.6 points to 87.2 per cent of the 1925-27 average after having established a six-year record the week before at 90.8 per cent.

Inasmuch as four out of five of the index's component series made gains last week, the drop in the general level of activity, occasioned by a sharply reduced automobile index, does not present a true picture. The explanation is that the decline occurred by comparison with the week before when a contra-seasonal increase in automobile production boosted the capital goods curve abnormally. Three weeks ago, the index stood at 82.2, showing that the trend of operations has not been reversed.

Strength in steel mill operations dominates the individual aspects of the heavy goods situation just at present. Last week THE IRON AGE's individual steel production index again advanced to a new record level for the year.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Cram's Reports, Inc.; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

## Porcelain Enamelers To Meet Oct. 1-2

THE sixth annual meeting of the Porcelain Enamel Institute will be held at the Hotel Statler, Cleveland, Oct. 1-2. The program will include talks by R. G. Calton, institute president and vice-president of the Tennessee Enamel Mfg. Co., Nashville, Tenn.; William Hogenson, president of the Chicago Vitreous Enamel Product Co., Cicero, Ill.; E. L. Lasier, vice-president of the Titanium Alloy Mfg. Co., Niagara Falls, N. Y.; R. A. Weaver, president, Ferro Enamel Corp., Cleveland; Rudolf W. Staud, sales promotion and advertising manager, Benjamin Electric Mfg. Co., Desplaines, Ill.; George S. Blome, vice-president, Baltimore Enamel & Novelty Co., Baltimore; Earle S. Smith, president, Toledo Porcelain Enamel Products Co., Toledo; Richard H. Turk, vice-president, Porcelain Enamel & Mfg. Co., Baltimore.

George F. Taubeneck, editor of *Electric Refrigeration News*, who has just returned from an extended trip around the world will talk on "What the Rest of the World Thinks About Porcelain Enamel."

# WASHINGTON. . . . . .

*. . . Electrical utility equipment buying expected after election.*

o o o

*. . . Bureau of Foreign and Domestic Commerce making market study of steel industry.*

o o o

*. . . Navy Department awards contracts for 10 destroyers and five submarines.*

o o o

*. . . Why did John Lewis go abroad? This is a popular question in Washington unofficial circles.*

o o o

By L. W. MOFFETT
*Resident Washington Editor, The Iron Age*

o o o

WASHINGTON, D. C., Sept. 1.—Tendency of the utility operators to delay purchases of equipment until after the coming election remains very much in evidence here in Washington, where it is realized that the utility interests have less confidence in the Administration than almost any other large group.

But that tendency is not holding up wide flung surveys designed to determine the amount of new equipment that will be required during the coming year, and Washington has learned that such surveys are now being conducted, though very quietly.

If the present indications are proved correct by developments a surge of buying orders will follow the counting of the votes no matter what the outcome of that count may be.

It is considered that the nation's demand for power will go on increasing, which, of course means installing of added units can not be much longer postponed.

One angle of this situation is worth noting. Delays in delivery are almost certain, especially if orders for large amounts of heavy equipment are lumped.

The National Press Club is not playing favorites, and having had William Green and John L. Lewis as speakers at luncheon, where their respective views have been aired with reference to the controversy over the attempts to organize the steel industry, the Iron and Steel Institute has been asked to send a speaker to present its side of the case, as well as to answer the many questions members can ask. The Institute has declined the invitation, giving as explanation the fact that a great many of its more prominent men are off on their summer vacations, and hence it has no one available for such an assignment.

Third in the series of studies of basic industrial markets, now being made by the Marketing Research division of the Bureau of Foreign and Domestic Commerce, will cover the iron and steel industry. The second in the series has recently been issued, covering "Gas and Electrical Utilities." This second report shows the location of plants by counties and gives data of interest to manufacturers of machinery and equipment.

The Research division also has completed and published a report on electric and gas facilities for domestic purposes, and is preparing a similar treatise for plumbing and heating facilities, based on returns from 64 cities.

"When do we strike?" is being asked with increasing insistence by the rank and file of the CIO unions. The question is but one of the many symptoms of the restlessness which is growing rapidly in their membership.

Another of the signs of that disquiet and discontent, if one is to credit the gossip heard in Washington, is the trip John L. Lewis is making to Europe. It is being asserted in Washington that he went overseas because it was felt that by so doing he would find it easier to hold the restive factions in line.

Many of the unions taken over by the Lewis contingent are none too well disciplined, and one of the dangers feared by the Lewis leaders is that action which would prove abortive, will be taken against the advice and consent of the chieftains. Such abortive action, as can easily be seen, would militate against the hoped for success of Lewis, as well as against his known desire to avert an open break before election.

There has been talk that Lewis

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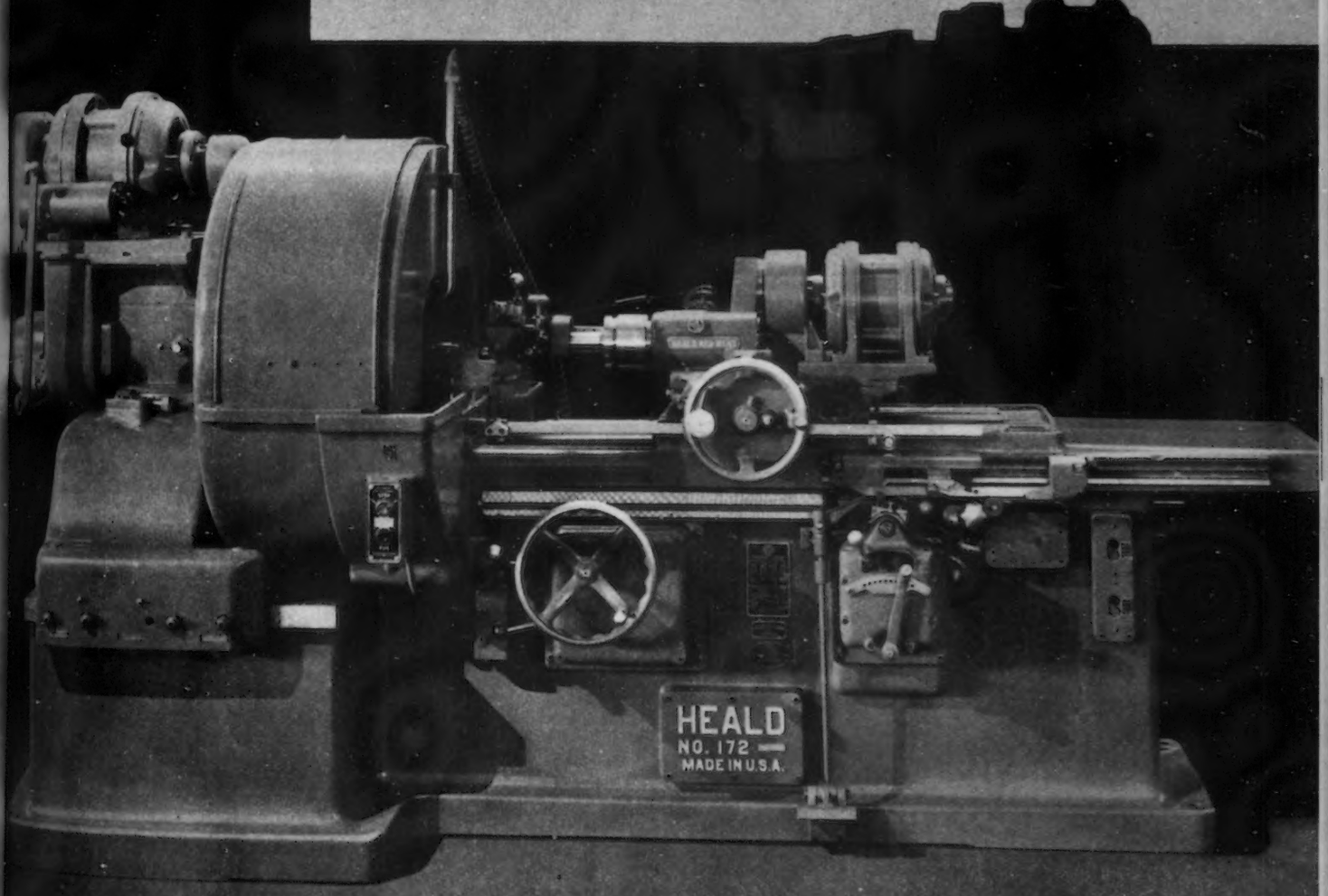
The controls and driving units are similar to the well-known No. 72 line of Internals. To take care of the type of work likely to be ground on this machine, it has a very low work center with a work guard that swings entirely back permitting overhead loading by a crane.

A new bulletin has just been printed. May we send you one?




The HEALD Machine Company, Worcester, Mass., U.S.A.

left the country to avoid Administration pressure, but this thought is being scouted by those on the inside, who point out that Lewis can be reached at any time by long distance phone. It is also asserted that the Adminstration is anxious to have Lewis out of the way so pressure can be more easily brought upon Major George L. Berry and Sidney Hillman, co-leaders in the CIO.

The same "wise ones" are calling attention to the fact that A. F. of L. leaders are working hand in glove with the CIO in plans for the dinner to be given to Harold Butler, director of the International Labor Office in Geneva.

## WPA Grants Tapering Under New Presidential Policy

WASHINGTON, D. C., Sept. 1.—Grants by WPA to municipalities will continue to cover labor costs only, as the President's recent talk at a press conference showed clearly. Mr. Roosevelt's remarks served to cheer those communities which have shown themselves ready to issue bonds on the basis of 45 per cent grants from WPA funds.

Despite this, however, Washington is growing more and more convinced that WPA is already sliding rapidly toward the bottom of the chute.

The President remarked that he has been conferring on the subject of WPA regulations with Secretary Ickes, and that WPA is going ahead rechecking every project with an eye out for two special types. The first type consists of those municipalities which have held elections to authorize issuance of bonds in expectation of a WPA grant. The President intimated the Government has a moral obligation in such cases.

The second type which will get special attention in the rechecking will be those communities which can take a substantial number of relief workers off the relief roll. Mr. Roosevelt announced he has approved between $3,000,000 and $5,000,000 for projects where virtually all the grant will be spent for wages of people taken from the relief rolls.

This move is expected to tie in closely with reclassification of skilled workers, as communities lacking such skilled labor can obtain it by going to a neighboring community.

WPA projects proving they can be counted on to take a substantial proportion of grant money to remove workers from relief rolls will have their propects approved without delay, the President intimated.

## Navy Ships Awarded; Take 12,000 Tons Steel

WASHINGTON, Sept. 1.—About 12,000 tons of plates, shapes and bars will be required for the 10 destroyers and five submarines awarded and allocated by the Navy Department last week. The destroyers will call for about 5400 tons of plates, 2700 tons of shapes and 900 tons of bars, while the submarine tonnages are estimated at 1800 tons of plates, 900 tons of shapes and 300 tons of bars.

Two destroyers each were awarded to the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., the Federal Shipbuilding & Dry Dock Co., Kearny, N. J., and the Bath Iron Works Corp., Bath, Me. Three submarines were awarded to the Electric Boat Co., Groton, Conn. Two destroyers were allocated to the Boston navy yard, and one each to the Norfolk, Va., and Charleston, S. C., navy yards. Two submarines were allocated to the Portsmouth, N. H., navy yard.

Allocation of the remaining vessels of the 1936 program, two destroyers and one submarine, to government yards, the department announced, will not be made until decisions are reached with regard to the construction of the floating dry dock for the Naval Station at Pearl Harbor, T. H., and of one battleship at an East coast yard. The Navy Department has announced that bids for the huge floating dry dock will be opened Sept. 30, but the date may be postponed as has been requested by shipyards. They have stated that the proposed date is too early in view of the fact that it will first be necessary to build a basin. The plate tonnage for the dry dock is estimated at 36,000 to 40,000 tons.

New York City will spend upward of $5,000,000 for snow removal trucks, on which bids were taken Aug. 27 by Purchase Commissioner Forbes, the White Motor Co., Cleveland, having submitted the lowest bids, offering 200 trucks at $5,533.87 each, 600 trucks with partitions at $5,595.87 each and 85 flushers at $5,875 each.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# Failing to Make Headway CIO Now Charges Coercion

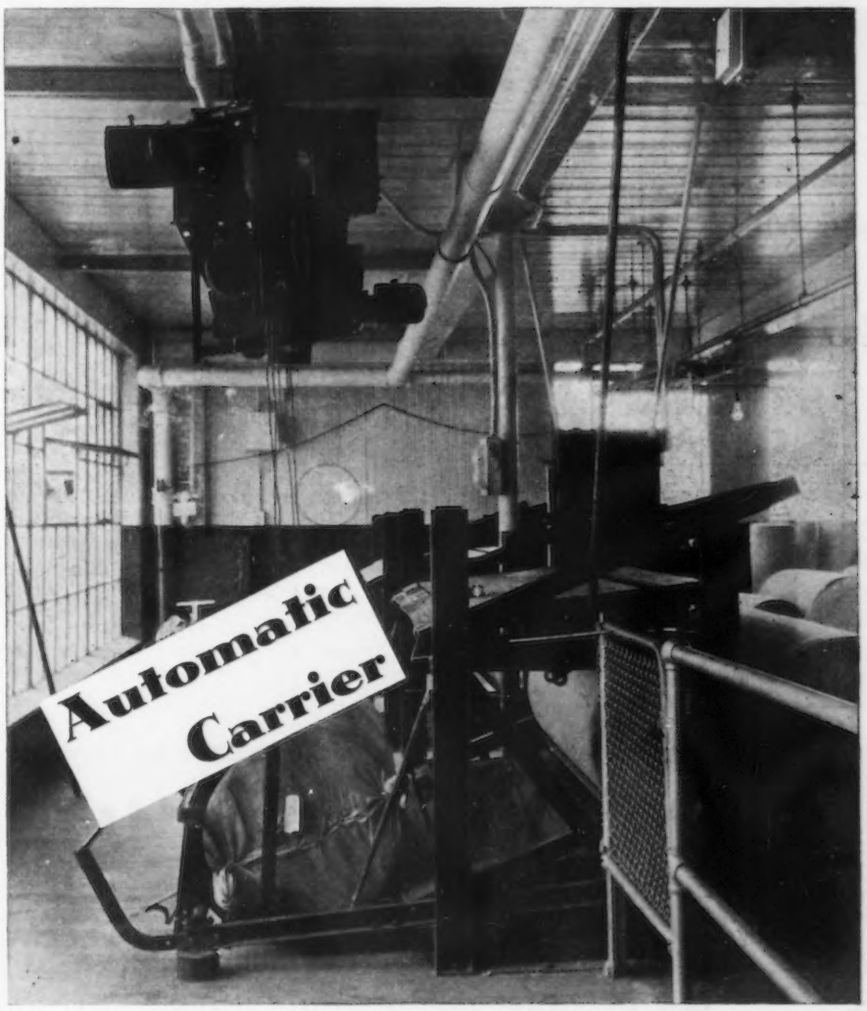
WASHINGTON, Sept. 1.—Further dragging of the iron and steel industry into politics in a particular effort to strengthen organized labor and other sources in moves to carry Pennsylvania for the New Deal was seen in the action yesterday of the special Senate Committee which is investigating campaign expenditures in ordering an immediate inquiry into campaign irregularities in Pennsylvania. Included in the allegations is that steel companies are coercing employees. The charges were filed by David L. Lawrence, chairman of the Pennsylvania State Democratic Committee, who asserted that employees of the Clairton, Pa., plant of the Carnegie-Illinois Steel Co., and the Aliquippa plant of the Jones & Laughlin Steel Corp. had been subjected to "intimidation and coercion." The charge did not in any way say in what respect the so-called "intimidation and coercion" were achieved. The charge by Lawrence was first made by him about 10 days ago in New York. At that time it was believed it would be followed by formal complaint filed with the Senate Committee, which is headed by Senator Augustine Lonergan, Democrat, of Connecticut. Accompanying Lawrence to Washington was Senator Joseph Guffey, Democrat, of Pennsylvania. Senator Lonergan said that the full committee or a subcommittee may go to Pittsburgh and nearby points within the next week or two.

The socalled investigation in Allegheny and Beaver counties will be in charge of Louis R. Glavis. Glavis formerly was chief investigator of the PWA under Ickes. Following a quarrel with Administrator Harold I. Ickes of the PWA, Glavis left the PWA and was taken over by the Senate Committee.

Meanwhile it is reported that another Senate Committee which is investigating socalled espionage and coercion in labor relations is planning ultimately to call industrialists before it, including steel executives. At present the committee is preparing to ask for indictments of officials of the Railway Audit and Inspection Co. for "contumacy" because of failure to appear before the committee. Indictments were asked by Senator LaFollette of Wisconsin, chairman of the committee, and the other member of the committee, Senator Thomas, Democrat, of Utah, concurred and certification of the information in the case was requested of Vice-President Garner. Organized labor representatives have spread charges that industrial plants have been supplied with arms in anticipation of labor trouble despite specific denials from various companies that they have engaged in such activities.

Along with these developments was the action of the General Executive Board of the International Ladies' Garment Workers' Union to do its bit toward unionizing the steel industry. The board voted to assess its members $1 each to raise

(CONCLUDED ON PAGE 88)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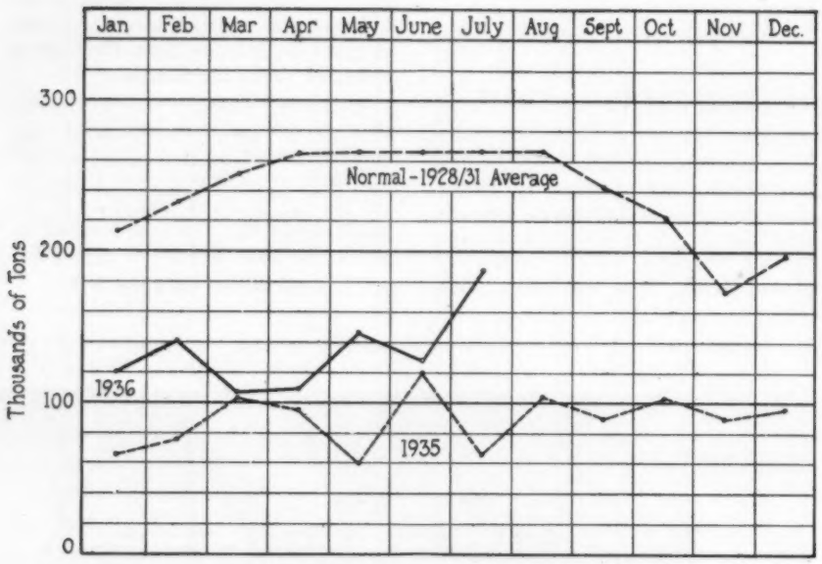


MONTHLY bookings of fabricated structural steel. Demand for construction material this year has steadily exceeded the 1935 volume. July sales show a sharp upward movement, raising the curve of activity toward parity with the line indicating normal.

*Chart by the American Institute of Steel Construction.*

# More Structural Steel for Buildings

ADDITIONAL evidence of recovery in the building industry is supplied by figures taken from the records of the American Institute of Steel Construction. These show that new business booked by the steel construction industry in July totaled 188,053 tons, an increase of 185 per cent over July, 1935, and the largest volume reported for any month during the recovery period.

The tonnage of fabricated structural steel represented by these orders was equal to 80.4 per cent of normal, "normal" being the yearly average of the period 1928-31. From January through July the bookings totaled in excess of 938,000 tons, having averaged 57.3 per cent of normal.


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# Lake Ore Movement May be 44,000,000 Tons

THE Great Lakes ore trade, which now believes that Lake ore movement during the 1936 season may total 42,000,000 or possibly as much as 44,000,000 tons, is experiencing the most active season by far since 1930, when a total of 47,187,661 tons was brought down the Lakes. The largest postwar ore movement, amounting to 66,157,359 tons, occurred in 1929 and was exceeded only once, in 1916, a war year, when 66,902,778 tons was moved down the Lakes.

This year's unexpectedly large movement is dictated by promising prospects for steel production during the fall and winter months and also by high prices for scrap. Steel companies evidently will fortify themselves with sufficient ore not only to take care of the expected demand for steel, but also as a protection against further advances in scrap prices, which might be counteracted by increased use of pig iron in steel making.

In 1930, when the ore movement was a few million tons in excess of the maximum predicted for this year, the total output of open-hearth and bessemer ingots was 39,286,287 tons, but steel output slumped sharply in 1931, and there was a carryover of ore of large proportions, amounting to 28,722,326 tons on May 1, 1931. The 1930 consumption of Lake ore was 45,192,180 tons and the 1931 consumption was only 24,114,753 tons. In 1932, the low point for steel production during the depression, only 10,283,520 tons of ore was consumed, and only 3,567,915 tons was brought down from Lake Superior mines.

If the August movement is approximately the same as that of July—7,159,563 tons—the total up to Sept. 1 will have been around 26,000,000 tons. And, if approximately the same volume is brought down during the two and a half months that remain during the ore shipping season, a total of close to 44,000,000 tons will have been reached.

# CONVENTIONS

Sept. 7 to 11—American Chemical Society, Pittsburgh. Charles L. Parsons, Mills Building, Washington, secretary.

Sept. 7 to 12—Third World Power Conference and Second Congress on Large Dams, Mayflower Hotel, Washington. O. C. Merrill, Interior Building, Washington, director.

Sept. 8 to 10—American Gear Manufacturers' Association, aboard Steamer Seeandbee sailing from Chicago to Cleveland. J. C. McQuiston, Penn Lincoln Hotel, Wilkinsburg, Pa., manager-secretary.

Sept. 9—Institute of Scrap Iron and Steel, Hotel Statler, Detroit. Benjamin Schwartz, 11 West 42nd Street, New York, secretary.

Sept. 14 to 15—Plain Washer Manufacturers' Association, Hotel Statler, Cleveland. Eugene Caldwell, 2100 South Bay Street, Milwaukee, secretary.

Sept. 16 to 19—American Society of Mechanical Engineers, Hotel Niagara, Niagara Falls, Sectional meeting. P. T. Wetter, 20 West 39th Street, New York, assistant secretary.

Sept. 22 to 25—Association of Iron and Steel Engineers, Hotel Statler, Iron and Steel Exposition, Convention Hall, Detroit. Brent Wiley, Empire Building, Pittsburgh, managing director.

Sept. 28 to Oct. 3—American Mining Congress, Civic Auditorium, Denver.

Oct. 1 to 2—Porcelain Enamel Institute, Hotel Statler, Cleveland. George P. MacKnight, 612 North Michigan Avenue, Chicago, secretary.

Oct. 5 to 7—National Industrial Advertisers Association, Benjamin Franklin Hotel, Philadelphia. M. R. Webster, 100 East Ohio Street, Chicago, secretary.

Oct. 5 to 10—Fourth Industrial Materials Exhibit, Hotel Roosevelt, New York. S. S. Kahn, Parker-Kalon Corp., 200 Varick Street, New York, secretary.

Oct. 8 to 10—Electrochemical Society, Hotel General Brock, Niagara Falls, Ont. Dr. Colin G. Fink, Columbia University, New York, secretary.

Oct. 15 to 17—Society of Automotive Engineers, first national aircraft production meeting at Ambassador Hotel, Los Angeles. John A. C. Warner, 29 West 39th Street, New York, general manager.

Oct. 18 to 22—American Institute of Mining and Metallurgical Engineers, Hotel Statler, Cleveland. Louis Jordan, 29 West 39th Street, New York, secretary.

Oct. 19 to 22—National Wholesale Hardware Association, Marlborough-Blenheim Hotel, Atlantic City. George A. Fernley, 505 Arch Street, Philadelphia, secretary.

Oct. 19 to 22—Wire Association, Hotel Cleveland, Cleveland. Richard E. Brown, 17 East 42nd Street, New York, secretary.

Oct. 19 to 23—American Society for Metals, Metal Congress and Exposition, Public Auditorium, Cleveland. W. H. Eisenman, 7016 Euclid Avenue, Cleveland, secretary.

Oct. 19 to 23—American Welding Society, Hotel Cleveland, Cleveland. M. M. Kelly, 33 West 39th Street, New York, secretary.

Oct. 19 to 23—American Gas Association, Auditorium, Atlantic City. Kurwin R. Boyes, 420 Lexington Avenue, New York, secretary.

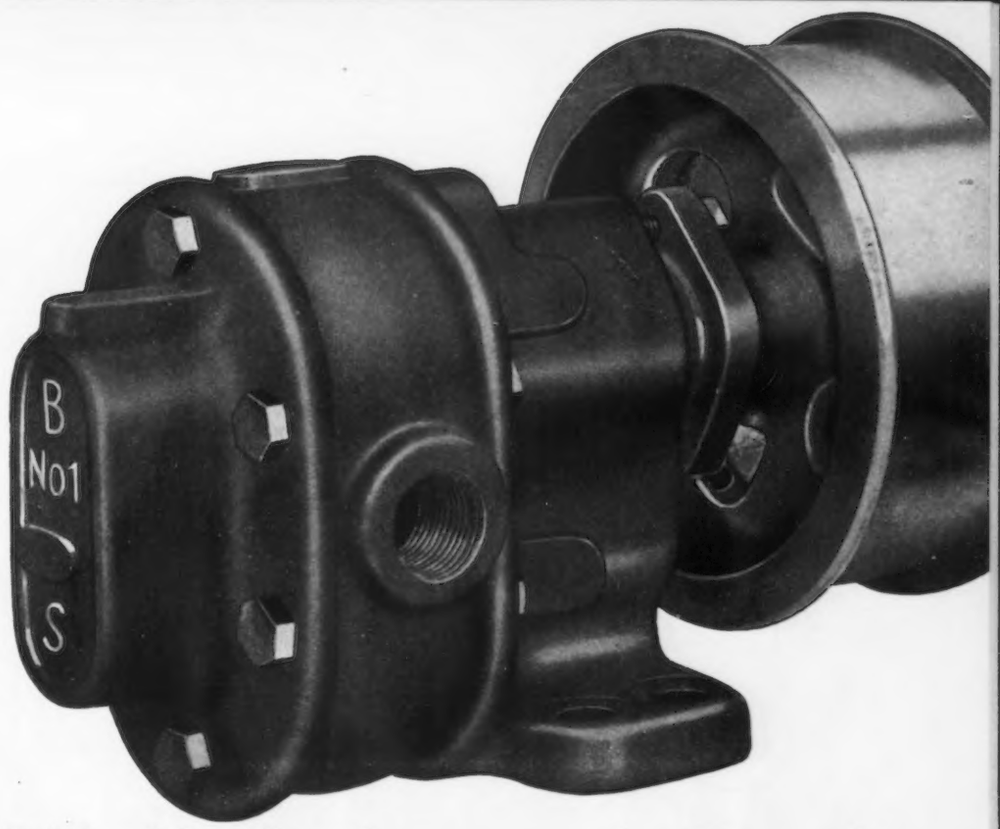
Oct. 20—National Association of Sheet Metal Distributors, Marlborough-Blenheim Hotel, Atlantic City. George A. Fernley, 505 Arch Street, Philadelphia, secretary.

Oct. 21 to 23—American Institute of Steel Construction, Greenbrier, White Sulphur Springs, W. Va. V. G. Iden, 200 Madison Avenue, New York, secretary.

Oct. 22 to 23—American Society of Mechanical Engineers. Fall meeting of iron and steel, machine shop practice and applied mechanics divisions, Hotel Cleveland, Cleveland. P. T. Wetter, 29 West 39th Street, New York, secretary.

Nov. 18 to 20—National Foreign Trade Convention, Chicago. Lindsay Crawford, 26 Beaver Street, New York, secretary.

Nov. 30 to Dec. 7—National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, Charles F. Roth, International Exposition Co., manager.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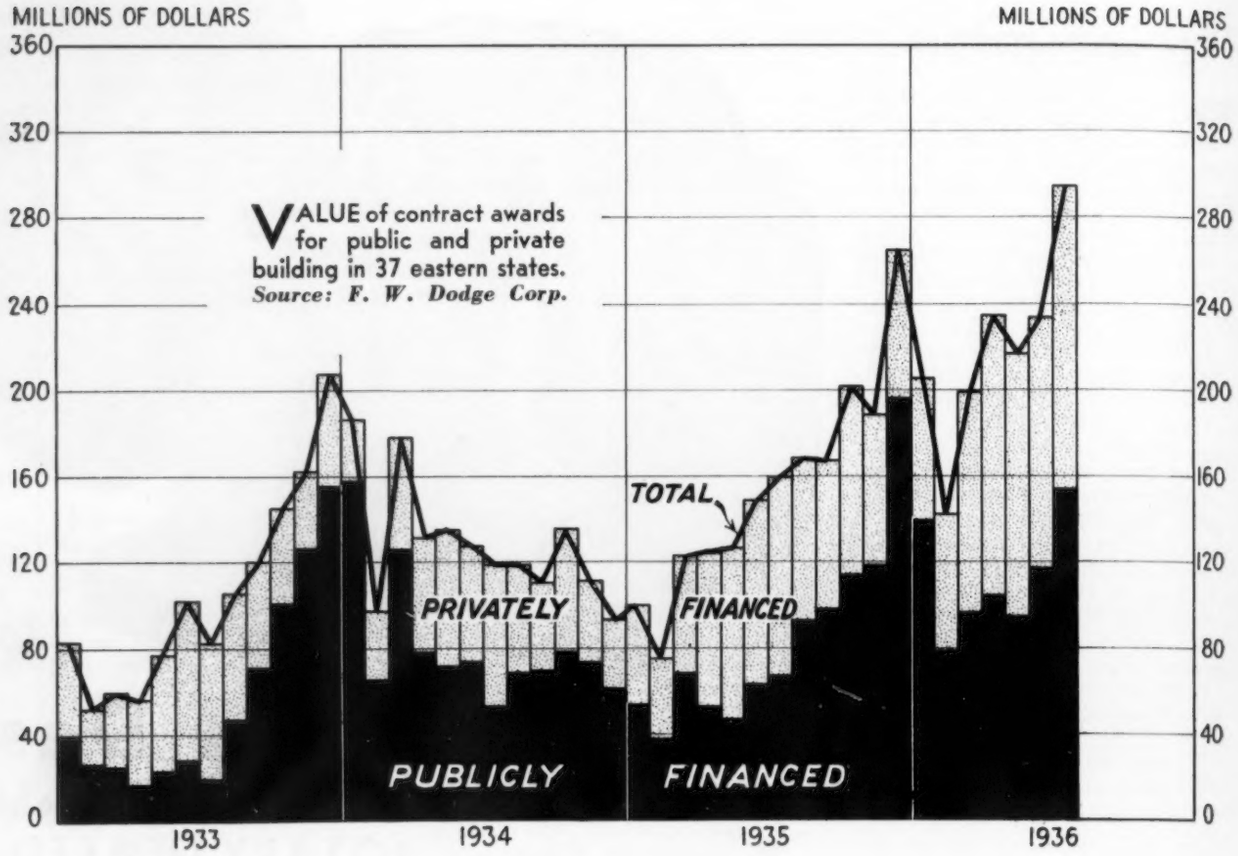


# Building Construction Gaining, Especially in Private Work

LARGER outlay of both private and public funds for construction work this year is reflected by the accompanying chart, based upon F. W. Dodge Corp. reports. The July total of contracts awarded amounted to $294,833,800, a gain of more than $61,000,000 over June and more than $135,000,000 over July a year ago. It was the largest volume reported for any month since June, 1931.

The total for the 37 eastern states in seven months this year was $1,532,564,500, indicating an increase of more than $676,000,000 over the expenditures for buildings in the comparable period last year. This represents a gain in activity of 79 per cent.

As between public and private work, so far this year about $783,500,000 has been publicly financed and about $740,900,000 has been privately subscribed. In other words, while not quite up to the mark set by public enterprise, private building activity has expanded to a volume representing 94½ per cent of the volume of public work undertaken. In 1934 the ratio of private to public construction was only about 58 per cent. The stimulus to private activity in the construction field is shown clearly on the chart.

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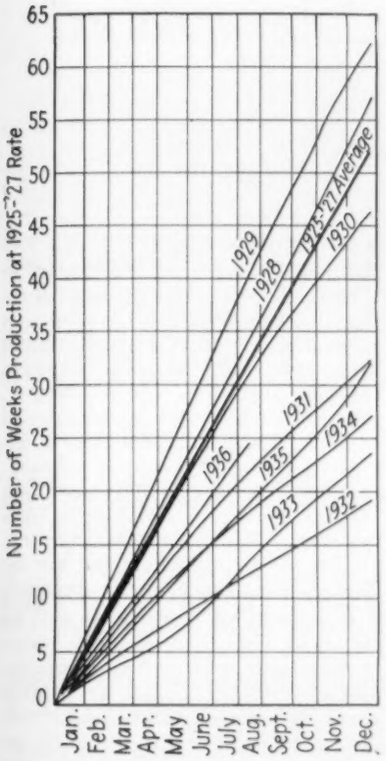
One of the largest spherical roller bearings in the world will be exhibited by **SKF Industries, Inc.**, Philadelphia, at the Iron and Steel Exposition in Detroit, Sept. 22 to 25. Weighing 3900 lb., this bearing, which is one of 12 purchased for hot and cold mill equipment in the Zaporojstal Steel Works in Russia, has an outside diameter of 46½ in. and a bore of 27½ in.

# "Deficiency" Still Exists in Production of Capital Goods

WHILE the demand for capital goods is now greater than at any time in the past half decade, the end of 1936 will mark the seventh consecutive year in which production has fallen beneath the average annual output of the 1925-27 period. In the accompanying chart THE IRON AGE index of capital goods activity has been put upon a weekly cumulative basis, each year shown separately.




CUMULATIVE weekly production of capital goods compared by years. The activity which produced the rise in the closing months of 1935 has continued unbroken, enabling 1936 in 32 weeks to accumulate the equivalent of over 24½ weeks' production at the 1925-27 average rate. Over the same period 1935 production amounted to less than 19 weeks.

Cumulative production at the average rate during the base period, which is shown as a diagonal straight line rising to a total of "52 weeks" in the last week of the year, provides the standard of comparison.

In conjunction therewith, it is seen that production of capital goods during 1928 and 1929 was substantially heavier than in the base period, but that each of the ensuing six years slumped beneath the standard, or normal volume of output. Thus, while it would have required 62 weeks at the average rate prevailing from 1925-27 to produce the volume of goods turned out in 1929 and 57 weeks in the case of 1928, business thereafter declined so rapidly that in 1932 the equivalent of only 19½ weeks of production was accounted for.

The indicated "surplus" for 1928 and 1929 was equal to 15 weeks' output at the 1925-27 rate, but the "deficiency" of the following six years, when lumped together, totaled 131 weeks. The net production deficiency over the entire period 1928-35, therefore, amounted to 116 weeks, which is equivalent to saying that in this time the capital goods industries underproduced themselves potentially to the extent of nearly two and a quarter years of production. During these eight years the same effect would have been created if the industries' plants had operated at normal up to September, 1933, and had then closed down completely until the beginning of 1936.

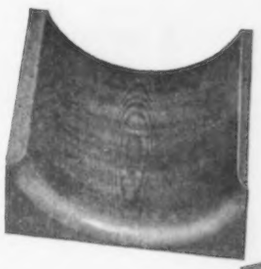
The average deficiency in production of capital goods which occurred annually from 1930-35 was equal to about five months' output

(CONCLUDED ON PAGE 88)


INSUROK
BEARINGS

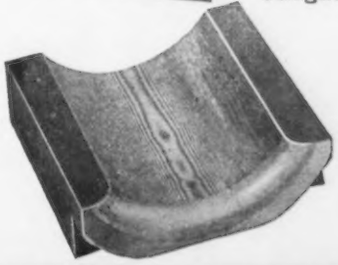
give more years of service per dollar

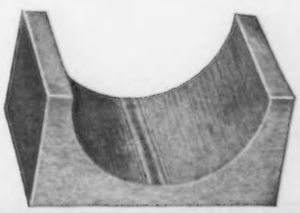
INSUROK Grade C and Grade CG (graphite impregnated) bearings, produced under exclusive Richardson processes, possess unusual qualities and advantages that make them ideal under severe conditions where unfailing service is essential. With a low coefficient of friction, unaffected by changes in temperature, heat-resisting INSUROK bearings are of great strength and density, tough, durable—able to withstand crushing overloads, to cushion the vibration and ease the strains and stresses of continuous operation.



Richardson Bearing Service

Richardson engineers will be glad to give you the benefit of their wide experience and technical knowledge in solving bearing problems. This service is available without cost or obligation.





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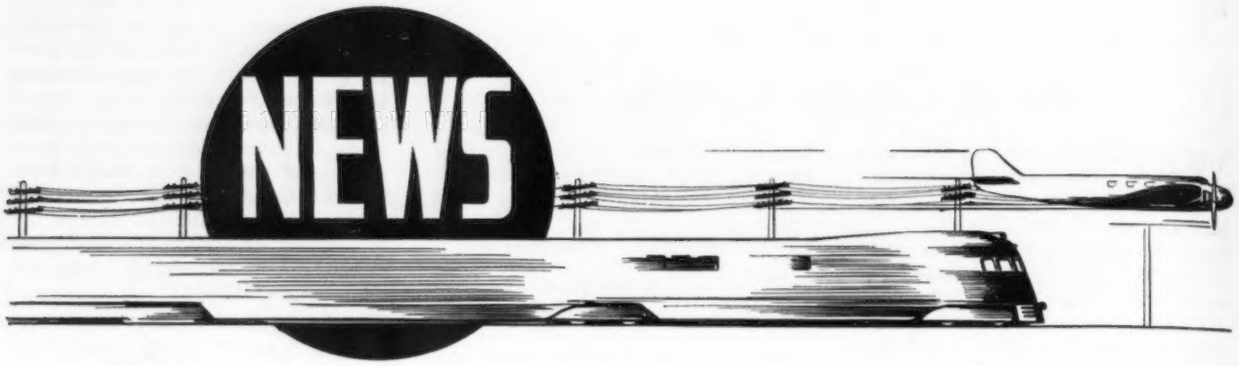


# No Steel Wage Increases Contemplated At This Time

THREE of the leading independent steel companies, Republic Steel Corp., National Steel Corp. and Youngstown Sheet & Tube Co., have issued statements that "no general wage increase is contemplated at this time." This was the language of a formal statement issued by Republic, while the position of the other two companies was made known to representatives of the press orally. Neither the United States Steel Corp. nor the Bethlehem Steel Co., the two largest employers of steel mill labor, has made known its position either to the public or to its employees. A smaller company, the Keystone Steel & Wire Co., Peoria, Ill., however, has announced the inauguration of a profit sharing plan that will immediately add 3c. per hr. to the average wages of its employees.

The formal statement issued by Republic Steel Corp. on the wage question was probably prompted by the recent publication in a Youngstown newspaper that a 10 per cent wage increase had been definitely decided upon and would shortly be announced. Republic's statement follows:

"No general wage increase is contemplated by Republic Steel Corp. at this time. The question is one which has been brought before the company by employee representatives in the orderly course of business under the representation plan from time to time during recent months. It is being carefully studied in the light of present earnings and future prospects, but no general adjustment has yet been determined.

"We believe that our employees should be paid the highest wage that the business can stand, and we expect to adhere to this policy.

"At present there is a gratifying increase in steel demand and operations. Our earnings have also improved, but only after an accumulated loss of $33,000,000. We hope that this upward trend will continue long enough to enable us not only to give a wage increase, but also to pay some dividends to our 42,000 stockholders as well. For the present, there is no economic justification for an increase in wages in our company.

"Business in general is still in a zone of considerable uncertainty, and, until there is more assurance that the present rate of activity in the steel industry is going to continue, it would be inadvisable for us to make any change in the present wage rates.

"Meanwhile, we will continue to

## NEWS AND MARKET INDEX


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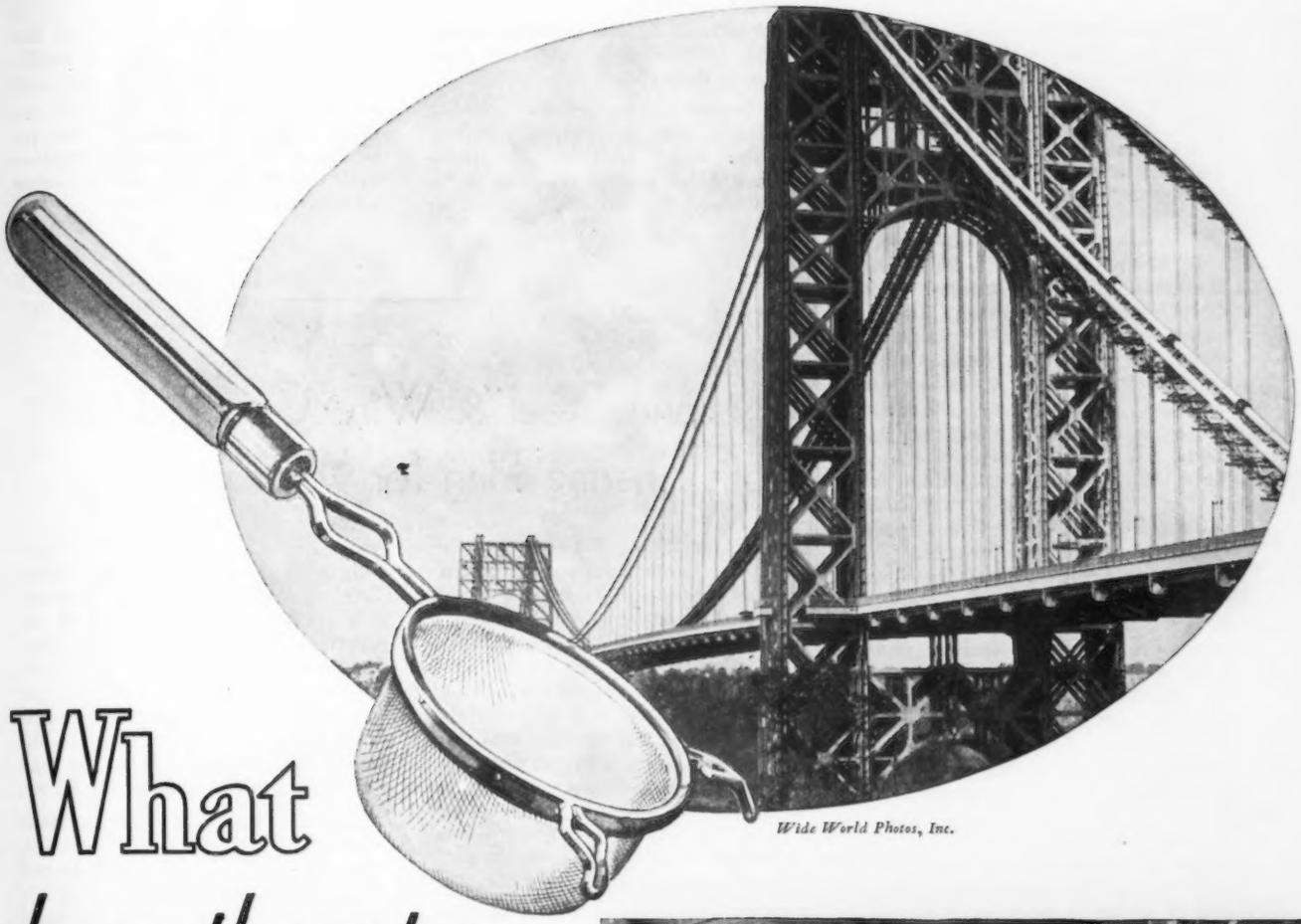


*Wide World Photos, Inc.*

# What *have these two in* Common?

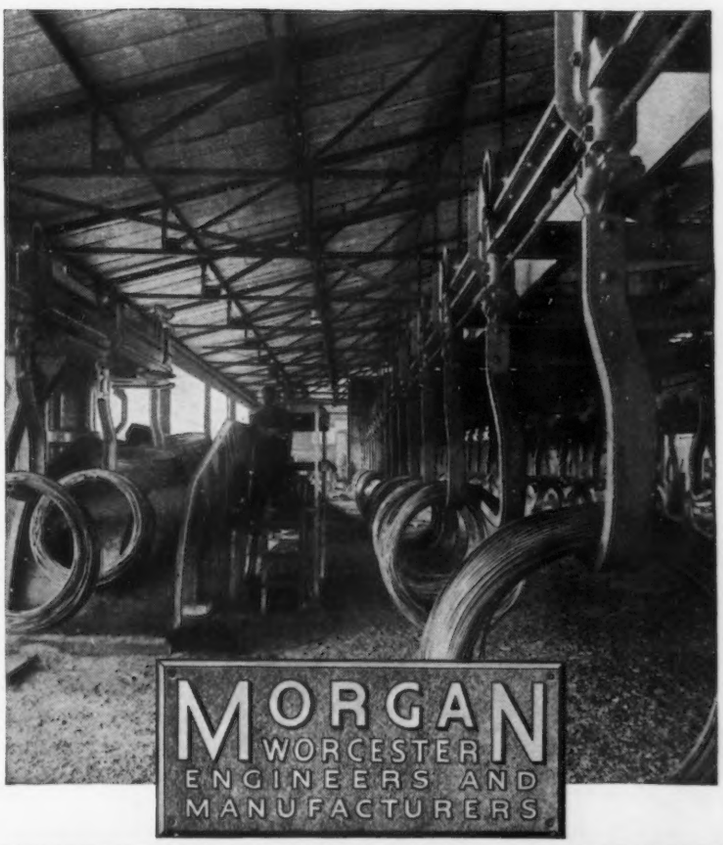
TONNAGE—with odds on the strainer. For this household necessity sells for a nickel—hundreds of millions a year.

Like the bridge, it is calling for closer standards in materials. In the automatic production chain where such items are manufactured, *costs are figured in fractions!* The cost of the finished article is influenced by the cost and quality of the mesh, of the wire, *of the rod from which this wire is drawn!*

Down through each process is heard the demand for more efficient production, closer standards in materials used. Can you meet the demand for uniform rod output with mills designed for the production needs of 20—40 years ago? No! Yet the market represented by these common everyday devices is growing—its tonnage is growing—and its profits will grow as rolling mills become equipped to do their share efficiently.

* * *

The modern Morgan Continuous Rolling Mill is a coordinated unit, engineered to produce rods of the required tonnage and desired accuracy. Sound engineering, backed by pioneering experience, is back of the Morgan reputation. R-10




**MORGAN CONSTRUCTION CO.**

**WORCESTER, MASS., U. S. A.**

study the situation carefully, both from the standpoint of business prospects and living costs, and frank and free discussion will continue to be held with employee representatives on this and other matters affecting the welfare of employees."

---

In New York, E. T. Weir, chairman of the National Steel Corp., gave a statement to the newspapers in which he said that the employees of his company had been notified, after extended discussions, that it was not warranted in increasing wages at this time. A Youngstown Sheet & Tube Co. official was quoted as saying that "we are giving careful consideration to the employees' requests for higher wages. No immediate wage increase, however, has been contemplated." Other steel company executives who were not mentioned by name were also quoted as saying that the financial condition of many of the steel companies, after five and a half years of losses, is not sufficiently strong to warrant wage increases unless prices were to be raised at the same time. It is pointed out that present wages, on an hourly basis, are 6 or 7 per cent higher than in 1929 while the cost of living is lower than in that year. Total payrolls are about $750,000,000 annually. It is pointd out that out of gross sales of $1,377,000,000 last year by 16 steel companies the employees received $565,300,000 or 41c. of each dollar, while stockholders received 1½c. of each dollar.

Whether the announced position of these steel companies disposes of the wage question for more than a brief period remains to be determined by events. It seems to be a prevailing opinion that the wage question can be more intelligently considered late in the year when the prospects for 1937 are more clearly outlined and the results of the Presidential election and the policies of the incoming administration are known.

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# Keystone Steel & Wire Co. Adopts Profit Sharing Plan for Workers

Keystone Steel & Wire Co., Peoria, Ill., has announced inauguration of a profit-sharing plan which will enable its employees to share in the net profits of the company. This plan will apply to the net profits for the fiscal year which began July 1, 1936, and will include profits earned during July and August of this year. The company has also announced an increase of 3c. per hr. in the average hourly earnings of all plant employees, effective from Sunday, Aug. 30.

The result of this wage increase and profit-sharing plan is expected to be an increase in the average annual earnings of employees of approximately 10 per cent. The 3c. increase in the hourly rate, together with the profit-sharing plan, will bring the average hourly wages of employees to the highest level in the history of the company —a level that is in excess of the average rate now paid in the steel industry and represents an increase of approximately 20c. per hr. over the average hourly rate paid in 1929, which prior to the fiscal year just ended was the peak year for the company's operations.

All employees of the Keystone Steel & Wire Co. as of June 30, 1937, and who as of that date had been in the company's employ six months or longer during the fiscal year, shall be eligible to participate in the profits of the company for the fiscal year ended June 30, 1937. Employees who are already participating in profits or who are on a sales commission basis shall not be eligible to participate.

The company will divide among the profit sharers a percentage of the net profits of the business for the fiscal year ended June 30, 1937, determined as follows: 4 per cent on all net profits up to $1,000,000; 8 per cent on the next $100,000; 12 per cent on the next $100,000; 16 per cent on the next $100,000; 20 per cent on all net profits over $1,300,000.

The actual amount of money to be divided among the profit-sharers will depend on the amount of the company's profits during the present fiscal year. Each profit-sharer shall participate in the profits to be divided in exact proportion to the amount of wages he receives during the year. No contractual obligations of any kind are undertaken or assumed by the company under, or by reason of the installation of, this profit-sharing plan. It is the intention of the company to continue this plan from year to year. The company, however, reserves the right to revise or to terminate the plan at the beginning of any fiscal year.

JAMES K. SUTHERLAND, who has been superintendent of the blooming, skelp and hot strip mill of the Youngstown Sheet & Tube Co., has been made assistant general superintendent of the Youngstown district in charge of the Brier Hill works. His first employment in the steel industry was in 1905 as a lamp repairman in the electrical department of the old Valley mill of the Republic Iron & Steel Co. In 1916 he became a pit craneman in the blooming mill of the East Youngstown works of the Youngstown Sheet & Tube Co. In 1919 he went with the Brier Hill Steel Co. as a heater in the blooming mill. Later he was successively a roller and turn foreman. In 1924, shortly after the Sheet & Tube company acquired the Brier Hill Steel Co., Mr. Sutherland was made superintendent of the blooming mill at the Brier Hill plant and three years later was transferred to the Campbell works as superintendent of the blooming and billet mills. In 1929 he was also given charge of the skelp mill and upon completion of the continuous hot strip mill in 1935 the superintendency of that mill was added to his other duties.

J. K. SUTHERLAND

❖ ❖ ❖

FRED M. RITTS, formerly manager of the St. Louis branch office of the building materials division of the Armstrong Cork Products Co., has been transferred to the executive offices of the company in Lancaster, Pa., where he will serve as manager of the high-temperature insulation department of the company. C. W. ROBINSON, formerly of the Chicago office, will succeed Mr. Ritts at St. Louis, and E. S. PENN, formerly of the Pittsburgh office, will take over the Albany, N. Y., office. R. H. CRAIG has been transferred from Lancaster to the branch office at Louisville.

❖ ❖ ❖

L. H. MESKER has been appointed Ohio sales agent, at 920 Hollenden Hotel, Cleveland, by the Reed-Prentice Corp., Worcester.

C. N. KIRKPATRICK, sales manager of the Landis Machine Co., Waynesboro, Pa., sailed on Aug. 28 on a business trip to England and the Continent.

❖ ❖ ❖

HAROLD W. STORY, vice-president and general counsel of the Allis-Chalmers Mfg. Co., Milwaukee, sailed for Europe on Aug. 25 for an extended business trip in connection with applications from about 15 concerns in England and France for licenses to manufacture certain power transmission devices on which the Milwaukee firm holds


# Specialized to Best Serve Your Individual Requirements

Thomastrip is more than just cold rolled strip steel. This better material is specially produced for the particular requirements of individual product fabrication. In every step of production from steel analysis to final finish and shipment, Thomastrip is engineered and controlled with exacting uniformity to the best specifications for the user . . . Greater production efficiency, better product quality, lower over-all costs are benefits you will gain by using specialized production Thomastrip. A Thomas representative will gladly cooperate in analyzing your requirements.

*Send for a copy of the new Thomas Handbook of valuable information on cold rolled strip steel.*

**THE THOMAS STEEL COMPANY**
WARREN, OHIO
*Specialized Producers of Cold Rolled Strip Steel*

Thomas Strip
COLD ROLLED STRIP STEEL
BRIGHT STEEL ZINK COATED
COPPER COATED

letters patent. He will be absent until November.

❖ ❖ ❖

R. B. NICHOLS, during the past eight years manager of the Chicago office of Bantam Ball Bearing Co., South Bend, Ind., has been appointed manager of the industrial bearing division. He has been identified with the bearing industry for over 12 years, most of the time with the Bantam company as factory superintendent of the South Bend plant and in Chicago.

R. B. NICHOLS

❖ ❖ ❖

F. D. WILSON, of the Babcock & Wilcox Co., New York, is to be the principal speaker at the first regular meeting of the Industrial Smoke Abatement Association of Hudson County, N. J., on "Modern Boilers and Refractories," on Sept. 17.

❖ ❖ ❖

ALEXANDER HAIGH has been appointed New England representative, with office at 141 Milk Street, Boston, for the W. W. Sly Mfg. Co., Cleveland.

❖ ❖ ❖

D. M. FRASER has been appointed motor sales representative for Canada by the Ohio Electric Mfg. Co., Cleveland. He is president of D. M. Fraser, Ltd., Toronto.

❖ ❖ ❖

EARL A. TANNER, vice-president of the Milcor Steel Co., Milwaukee, and for the past six years manager of its works at Canton, Ohio, has been transferred to the general offices in Milwaukee as director of sales. He is succeeded by ALEX U. STEENROD, until now manager of the Chicago warehouse. Mr. Steenrod is in turn succeeded by J. HARRY CHRISTMAN, vice-president.

❖ ❖ ❖

ROBERT W. WILSON has resigned as vice-president and a director of the Perfex Radiator Co., Milwaukee, to become associated with the McCord Radiator & Mfg. Co., Detroit, as director of engineering and sales of its industrial radiator division at Plymouth, Ind. He is a graduate of the University of Pennsylvania and has been active in the industrial and automotive radiator industry for many years.

❖ ❖ ❖

HENRY J. HELD, president of the Rundle Mfg. Co., and vice-president of the Wisconsin Sanitary Mfg. Co., Milwaukee, sailed on Aug. 29 for Europe to attend the convention of the International Foundrymen's Association at Düsseldorf, Germany. He will also visit England, France and Switzerland.

❖ ❖ ❖

ROBERT F. MCCLOSKEY has been appointed president of the Blaw-Knox Construction Co. and Hoboken Land Co., vice-president of Blaw-Knox International Corp., National Alloy Steel Co. and A. W. French & Co., and has been made a director of Union Steel Casting Co. and Pittsburgh Rolls Corp., all subsidiaries of the Blaw-Knox Co.

FRANK J. LASKEY, new general purchasing agent of the Republic Steel Corp., Cleveland, whose appointment was noted in these columns in the issue of Aug. 20.

❖ ❖ ❖

H. B. LOXTERMAN has been made a vice-president of the Blaw-Knox Construction Co., Blaw-Knox International Corp. and Hoboken Land Co.

❖ ❖ ❖

F. A. BEATTY has been elected vice-president of Groveton Land Co., and ALBERT L. CUFF has been made a director and secretary of Blaw-Knox Construction Co. and other subsidiary companies.

❖ ❖ ❖

GEORGE METZGER recently completed 66 years of service with Henry Disston & Sons, Inc., Philadelphia. He has been a member of the Philadelphia chapter of the American Society for Metals for many years.

❖ ❖ ❖

STEPHEN M. JENKS has been appointed chief engineer of the newly established construction engineering division of the Carnegie-Illinois


**PERFORATED METALS**

**INDUSTRIAL, ARCHITECTURAL, DECORATIVE**

Industrial Screens for all purposes.
Cane and Machinery Guards.
Grilles to meet all requirements for heating, ventilating and air conditioning.
Registers and Cast Grilles.
DIAMOND has a national reputation for perforated metal products of the better quality.

**DIAMOND MANUFACTURING CO.**

Wyoming, Penna.

*Sales Representatives in all principal cities.*

Steel Corp., with offices at Pittsburgh. Mr. Jenks was graduated from Cornell University in 1923 with the degree of mechanical engineer, and started his business career in the Aliquippa works of the Jones & Laughlin Steel Corp. In 1925 he went with the United States Steel Corp. in the engineering department of the American Sheet & Tin Plate Co. in Pittsburgh, and in 1929 he was transferred to the Gary sheet and tin plate mills as fuel engineer. Returning to Pittsburgh in 1933, he was made power engineer of the same company and in 1935 was promoted to assistant chief engineer, which position he held until his recent appointment.

❖ ❖ ❖

F. AUSTIN DAVEY, who has been identified for the past 22 years with the Empire Sheet & Tin Plate Co., Mansfield, Ohio, has resigned as chief engineer. He plans a long vacation before becoming active in the steel business again.

❖ ❖ ❖

WILLIAM HOGENSON, JR., has been named special representative on Toncan iron enameling stock by Republic Steel Corp. He will work in conjunction with that department under the new product development division. He has a background of technical and business training gained at the universities of Michigan and Chicago and a close association with the enameling industry through his recent connection with the Chicago Vitreous Enamel Product Co.

## ...OBITUARY...

JOHN F. JACKSON, vice-president of the Wisconsin Bridge & Iron Co., Milwaukee, from 1906 until his retirement in 1926, died on Aug. 22, aged 71 years. He was graduated in 1886 from Ohio Northern University as a civil engineer and joined the Wisconsin firm in 1890, supervising many of its notable bridge and other steel structure projects. Mr. Jackson pioneered in the use of steel in place of wood in copper mining in upper Michigan. He remained a director of the Wisconsin company until his death.

* * *

WILLIAM P. WESTENBERG, secretary and treasurer of the Wisconsin Malleable Iron Co., Milwaukee, for many years until its discontinuance in 1930 following a disastrous fire, died on Aug. 26, aged 67 years.

❖ ❖ ❖

JOHN C. HASWELL, president of the Dayton Malleable Iron Co., Dayton, Ohio, died at his home in that city on Aug. 27, aged 69 years. He was also president of the Pratt & Letchworth Co., Buffalo, the G. H. R. Foundry Co. and the Republic Jack Co., both of Dayton. He was a member of the board of the National Cash Register Co.

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**Reid-Avery Co.**, Dundalk, Baltimore, Md., manufacturer of welding rods and wire, has removed its general office from Philadelphia to Dundalk.

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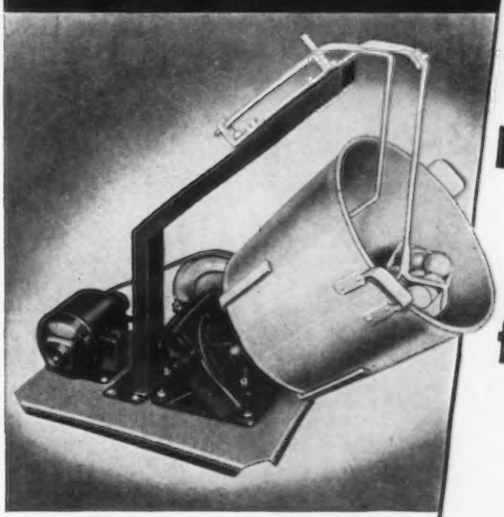
# UDYLITE HANDIPLATER



*The Handiplater may be used with any plating solution common to barrel plating operations. It may also be used for acid tumbling, sawdust drying, etc.*

**The Ideal Inexpensive Unit for Plating Small Loads**

**For the occasional handful or for actual production plating of very small parts, the Handiplater is the ideal unit. The capacity of the steel, rubber-lined, plating cylinder ranges from a handful up to ½ peck of work. The Handiplater operates with a few gallons of plating solution dipped from the regular still or barrel plating tank.**

**Plating cylinder and anode-cathode assembly are readily detachable, making loading and unloading a simple operation. The detachable cylinder also makes possible the use of a variety of plating solutions with one machine.**

**The Handiplater is portable, takes up little space. It operates efficiently and is a most sturdy outfit from the fabricated steel base to the steel, rubber-lined, plating cylinder.**

**Write for descriptive bulletin.**

**THE UDYLITE COMPANY**
**1651 E. Grand Blvd., Detroit, Mich.**

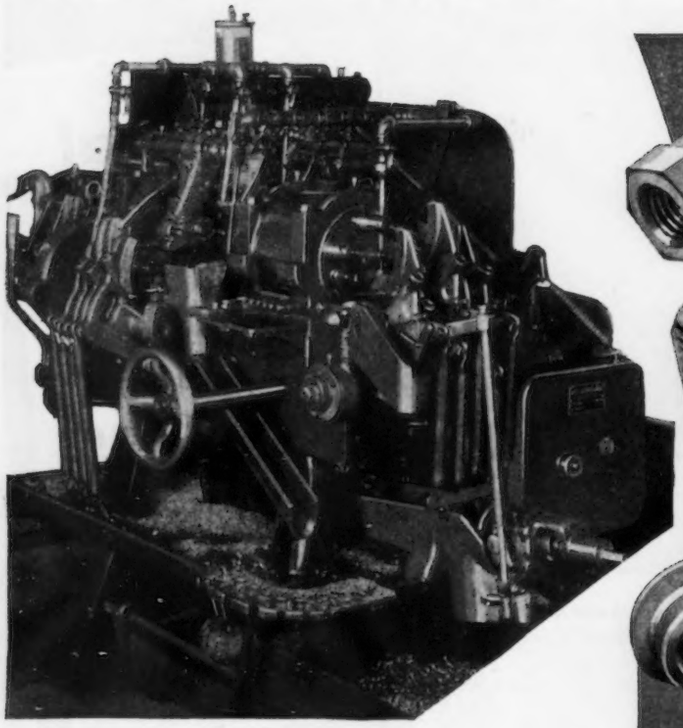
New York 30 E. 42nd Street | Chicago 1943 Walnut Street | Cleveland 3756 Carnegie Ave. | San Francisco 114 Sansome Street

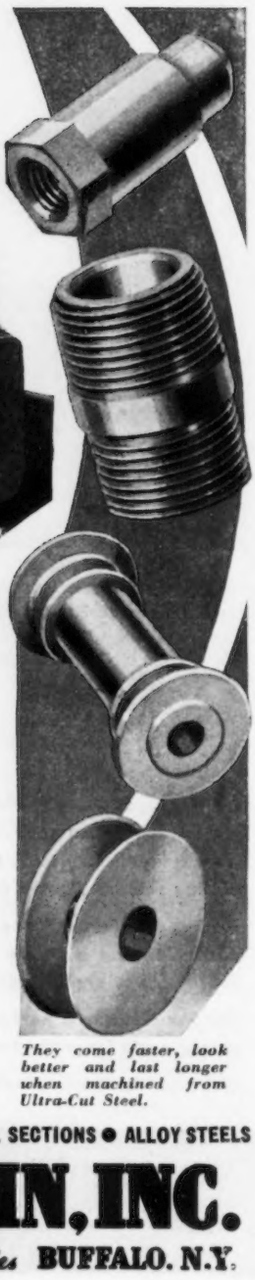
# Pig Iron Output in August Rose 4.5 Per Cent Over July

ESTIMATED production of coke pig iron in August totaled 2,711,431 gross tons, compared with 2,594,268 tons in July. The daily rate in August, at 87,466 tons, was 4.5 per cent above the 83,686 tons in July. There was a gain of one furnace, 147 being in blast on Sept. 1, against 146 on Aug. 1.

Among the furnaces blown in during the month were: One Monessen, of the Pittsburgh Steel Co.; one Indiana Harbor, of the Youngstown Sheet & Tube Co.; one Sparrows Point, of the Bethlehem Steel Co., and one Toledo furnace of Pickands, Mather & Co. Furnaces blown out or banked were: Standish furnace, Chateaugay Ore & Iron Co.; one South Chicago, Youngstown Sheet & Tube Co., and one Madeline, Inland Steel Co.


# Ultra-Cut STEEL





**When a rush of orders pushes the production department to the utmost—what can you do to boost output?**

**You will find the answer in Ultra-Cut Steel. This "Ace of Screw Stocks" will act as an accelerator on your automatic machines. You can increase the feed and the speed, obtaining 30% to 40%, or more pieces per hour.**

**This lowers costs without sacrifice of quality, for Ultra-Cut is noted for its ability to produce finely finished parts with clean, sharp threads and smooth, uniform surfaces.**

**Try Ultra-Cut on your next order—or let us submit sample bars for test—performance is the best argument for Ultra-Cut Screw Stock.**

*They come faster, look better and last longer when machined from Ultra-Cut Steel.*

**COLD DRAWN BARS AND SHAFTING ● ULTRA-CUT STEEL ● SPECIAL SECTIONS ● ALLOY STEELS**

**BLISS & LAUGHLIN, INC.**

**HARVEY, ILL.** *Sales Offices in all Principal Cities* **BUFFALO, N.Y.**


# Real Weekly Earnings Declined in July

BECAUSE of a decrease in average hours and an increase in the cost of living, real weekly earnings in manufacturing industry declined in July as compared with the previous month, according to the National Industrial Conference Board.

The board's regular monthly survey covering 25 manufacturing industries indicates a moderate increase in employment, no change in hourly earnings, and a decline in weekly earnings.

Employment rose 0.8 per cent from June to July, and total man-hours, 0.3 per cent. Payroll disbursements, on the other hand, remained the same as in June.

Average hourly earnings in July were 61.7c., the same as in June. The average work-week declined from 39.4 hr. in June to 39.2 hr. in July, or 0.5 per cent. Actual weekly earnings averaged $24.23 in July as compared with $24.45 in June, a reduction of 0.9 per cent. Real weekly earnings were 1 per cent lower in July than in June.

Since July, 1935, hourly earnings have risen 2.8 per cent; actual weekly earnings, 10.9 per cent; real weekly earnings, 7.3 per cent; average hours of work, 7.4 per cent; employment, 8.7 per cent; total man-hours, 16.6 per cent; and payrolls, 20.7 per cent.

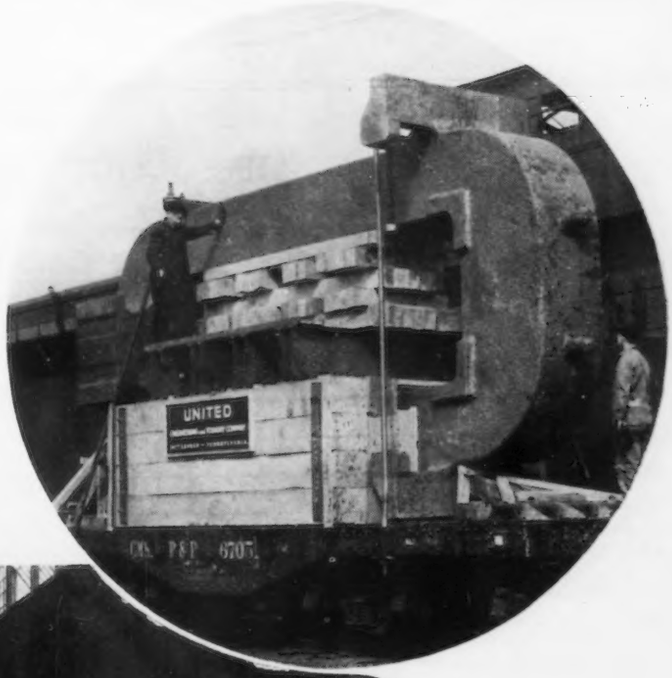
Gains over the July, 1929, level were noted in July, 1936, insofar as actual hourly and real weekly earnings are concerned, although the number of workers employed was still 13.2 per cent less. The advance in hourly earnings amounted to 5.1 per cent and in real weekly earnings, to 0.4 per cent. Actual weekly earnings in July, 1936, were 14.7 per cent lower than than in July, 1929, and the average workweek was 19 per cent less. Total man-hours worked were 29.7 per cent and payroll disbursements, 25.9 per cent below the July, 1929, level.

---

**Sloss-Sheffield Steel & Iron Co.** has announced a $3.50 dividend on preferred stock, payable Sept. 15. This is the first since 1930.

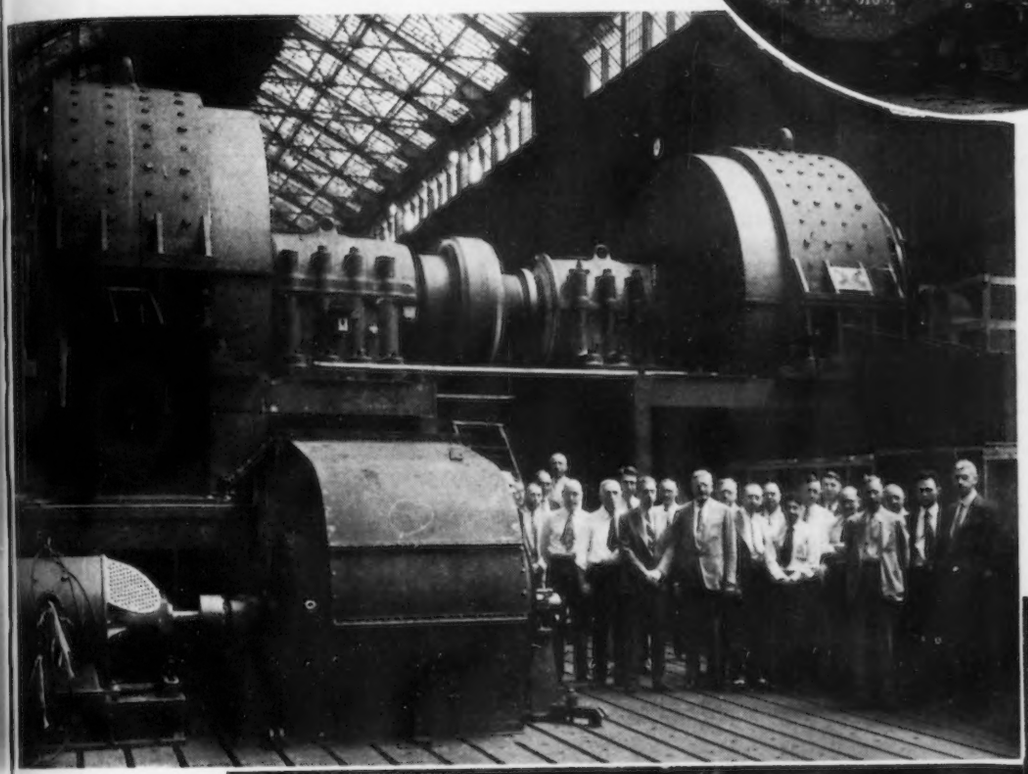
# FEATURES OF NEW STEEL MILL CONSTRUCTION

## As Seen by the Camera



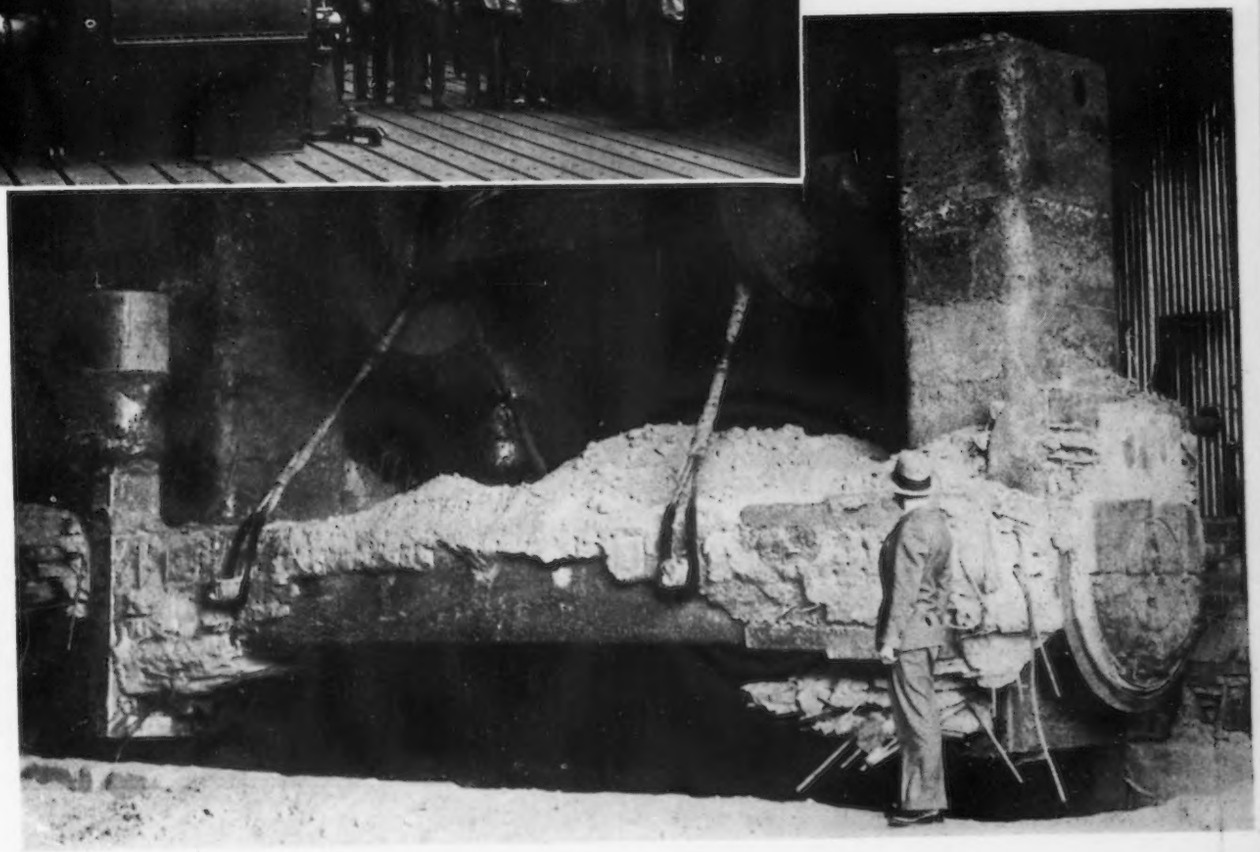

BELOW

TWO 7000 h.p. electric motors for steel mill service are coupled together on test in the East Pittsburgh works of the Westinghouse Electric & Mfg. Co. The inspection was witnessed by operating men of the Carnegie-Illinois Steel Corp. representing plants at Clairton, Duquesne and Homestead. The motor pictured, with the group clustered around the commutator, will be installed at the Homestead plant of Carnegie-Illinois, where it will furnish the main drive for the new 100-in. plate mill. The other motor will be installed in a mid-west steel plant. Each of the motors weighs 200 tons and turns at 40 r.p.m.



ABOVE

WEIGHING 275,000 lb., being 28 ft. 3 in. long and 14 ft. 5 in. at the widest point, this housing is one of several going into construction of the continuous 100-in. plate mill at the Homestead plant of Carnegie-Illinois Steel Corp. These housings, manufactured by United Engineering & Foundry Co., are said to be the largest single cast housings ever made. The backup rolls which fit into the windows of the housing will be 52 in. in diameter and 100 in. long, while the work rolls are 42 in. in diameter and 100 in. long.

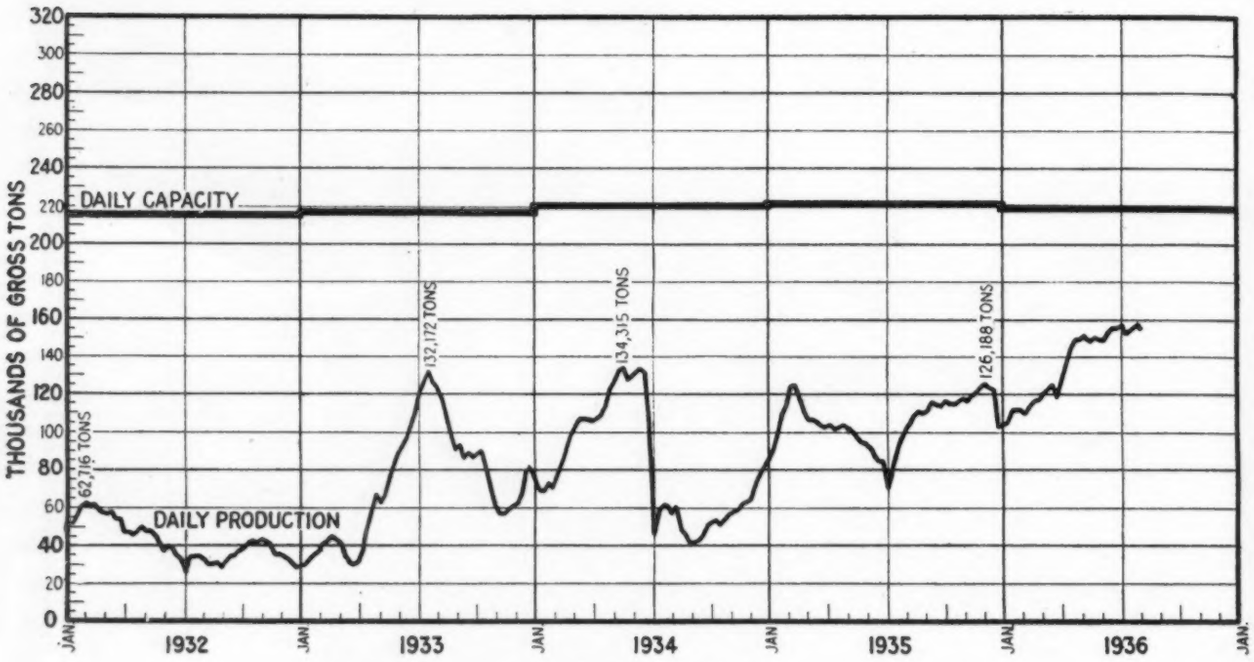


THIS 400,000-lb. steel casting, said to be the largest commercial casting ever made, is one of four turned out by Otis Steel Co., Cleveland, for United Engineering & Foundry Co. for mill housings for a four-high continuous mill to be installed by a Pittsburgh district steel plant. The casting is 32 ft. high, 14 ft. wide and its solid thickness in the leg section is 3 ft. It was made in a specially constructed reinforced concrete steel pit mold 36 ft. by 16 ft. and 10 ft. deep. The mold was top poured through six gates and risers from two 150-ton bottom pouring open-hearth ladles, most of the metal being poured through one gate.

# STEEL INGOT PRODUCTION

Daily Tonnage of Bessemer and Open-Hearth Steel Ingots Produced by Weeks, 1932-1936

| Current Week | Last Week | Weeks Ended Sept. 7, 1935 | Sept. 8, 1934 | Sept. 9, 1933 | Sept. 10, 1932 |
|---|---|---|---|---|---|
| 158,020 | 160,215 | 111,798 | 41,836 | 93,171 | 31,358 |




Latest values plotted on the above chart are for the past week in each case.

## STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

| District | Current Week | Last Week | Weeks Ended Aug. 8, 1936 | Sept. 7, 1935 | Sept. 8, 1934 |
|---|---|---|---|---|---|
| Pittsburgh | 69.0 | 72.0 | 69.0 | 44.0 | 9.0 |
| Chicago | 73.0 | 73.0 | 73.0 | 57.0 | 23.0 |
| Valleys | 76.0 | 78.0 | 77.0 | 60.0 | 20.0 |
| Philadelphia | 55.0 | 55.0 | 55.0 | 38.0 | 18.0 |
| Cleveland | 78.0 | 76.0 | 80.0 | 45.0 | 24.0 |
| Buffalo | 74.0 | 77.5 | 77.5 | 32.0 | 19.0 |
| Wheeling | 96.0 | 96.0 | 94.0 | 77.0 | 24.0 |
| Southern | 60.5 | 60.5 | 54.0 | 46.0 | 25.0 |
| Ohio River | 89.0 | 86.0 | 81.0 | 60.0 | 20.0 |
| Western | 70.0 | 70.0 | 65.0 | 35.0 | 10.0 |
| St. Louis | 71.0 | 75.0 | 66.0 | 37.0 | 25.0 |
| Detroit | 100.0 | 100.0 | 100.0 | 95.0 | 76.0 |
| Eastern | 90.0 | 90.0 | 90.0 | 35.0 | 20.0 |
| Aggregate | 72.0 | 73.0 | 72.0 | 50.5 | 19.0 |
| Average Year to Date | 63.7 | 63.4 | 62.6 | 45.9 | 41.6 |

## Weekly Booking of Construction Steel

FROM THE IRON AGE

| | Week Ended Sept. 1, 1936 | Aug. 25, 1936 | Aug. 4, 1936 | Sept. 4, 1935 | Year to Date 1936 | 1935 |
|---|---|---|---|---|---|---|
| Fabricated structural steel awards | 11,265 | 20,045 | 15,000 | 8,825 | 759,355 | 507,860 |
| Fabricated plate awards | 210 | 1,370 | 685 | 12,200 | 164,255 | 100,920 |
| Steel sheet piling awards | 695 | 0 | 275 | 2,550 | 39,785 | 39,335 |
| Reinforcing bar awards | 3,315 | 4,130 | 9,750 | 87,550 | 254,325 | 221,540 |
| Total Lettings of Construction Steel | 15,485 | 25,545 | 25,710 | 111,125 | 1,217,720 | 869,655 |

# . . . . SUMMARY OF THE WEEK. . . .

***. . . Steel ingot output slightly lower at 72 per cent.***

° ° °

***. . . Uncertainty exists as to prices for fourth quarter.***

° ° °

***. . . Wage issue, involving prices, probably postponed to end of year.***

STEEL ingot output this week has declined one point to 72 per cent of the industry's capacity, chiefly because of a temporary restriction in production by the leading producer in the Pittsburgh area. Elsewhere conditions remain substantially unchanged from recent weeks, although there has been a slight easing of the deliveries on some products, notably cold-rolled sheets, owing to the fact that the automobile industry has not yet reached its peak of ordering for new model manufacture.

Users of steel are ready to place volume orders for fourth quarter delivery, but some of the mills are not accepting such business until the price situation for that period shall have become clarified. No price announcements have been issued this week except on pig iron, current quotations for that product having been extended into the fourth quarter by leading producers. There is apparently a disposition among some of the steel companies not to disturb the existing price level for the time being, although a few minor changes upward may take place. No general price advance, however, is anticipated until late in the year, when business prospects for 1937, which now appear highly promising, will be more clearly outlined, and results of the Presidential election and policies of the incoming administration known.

The question of steel mill wages is so closely tied in with prices that one cannot be decided without affecting the other. The statement of a few steel companies that no wage increase is contemplated at this time does not definitely dispose of the issue further than to postpone final action perhaps for a few months. It is now generally regarded as certain that a complete determination of both wages and prices will be reached by one or more of the major companies toward the end of the year. Steel companies are deeply concerned over the complexity of the situation, which involves the triple obligation to stockholders and to labor and to their customers, whose continued buying power is essential to the maintenance of the present highly satisfactory volume of business. One of the smaller companies has resolved the problem by instituting a profit sharing plan that will mean about 10 per cent increase to workers.

MEANWHILE, orders are flowing to the mills in an almost uninterrupted stream. Whatever falling off occurs in some products, such as is occasioned by the in-between season in the automobile industry and virtual completion of 1936 production by refrigerator manufacturers, is made up by increased demand elsewhere. For example, large orders were placed by railroads for track supplies, including upward of 21,000 tons by the Santa Fe, prior to a price advance of $2 a ton, announced some time ago, which became effective Sept. 1. Moreover, a rail buying movement is imminent that may total several hundred thousand tons. One road will buy close to 90,000 tons.

As first evidences appear of a car shortage, equipment buying programs, which have been slowly developing, probably will be hastened. The Kansas City Southern is ready to buy 1000 freight cars and 10 locomotives, and other equipment inquiries of size are expected in the market soon.

Automobile production will undoubtedly decline further before hitting its full stride on 1937 models.

Building construction, as reflected by current lettings of structural steel and reinforcing bars, is in a slight lull, but much work is ahead, both public and private.

AN advance of $1 a ton in heavy melting steel scrap at Pittsburgh and one of 25c. at Philadelphia has raised THE IRON AGE composite price for this commodity to $16, the highest since Oct. 1, 1929. Other raw material markets are more active. Pig iron consumption by foundries is increasing in the Central West as makers of automobile castings swing into production on new models. Coke is becoming more scarce and more beehive ovens, long idle, may be rebuilt to supplement by-product coke output.

Pig iron production in August, as estimated by THE IRON AGE from reports on Tuesday, totaled 2,711,431 gross tons, compared with 2,594,268 tons in July, the daily rate having been 87,466 tons against 83,686 tons in the previous month, a gain of 4.5 per cent. Furnaces in blast Sept. 1 totaled 147, a gain of one since Aug. 1.

# . . . PITTSBURGH . . .

***. . . Ingot output in district drops three points to 69 per cent.***

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***. . . However, general demand for steel remains good.***

o o o

***. . . Plate deliveries 60 days; steel scrap $1 higher.***

PITTSBURGH, Sept. 1. — Ingot output in the Pittsburgh district this week is down three points to 69 per cent of capacity. The drop is ascribed to a temporary revision downward of the leading producer's schedule. Independent plants are maintaining production at the same level as last week. Ingot operations in the Wheeling district are unchanged at 96 per cent of capacity.

General demand has held up during the past week and has shown improvement on several items. Bookings for heavy materials continue good, with plate mills 60 days behind on deliveries.

Specifications for hot-rolled bars emanating mostly from miscellaneous sources have shown further improvement this week. While deliveries are slightly better, no material change has been made in mill backlogs. Specifications for sheets remain at the rate of the week before. Considerable tonnage is moving to makers of electrical appliances, and automotive tonnages are showing some increase.

Recent price announcement on electrical sheets involving a $2 increase for fourth quarter delivery is driving in orders for this type of material.

Tin plate production continues at 90 per cent, with unmistakable signs that business lost on account of the drought will be partially made up by a persistent demand for general line can goods and better than expected fruit and fish packs.

There is some evidence that steel consumers are showing a more liberal tendency toward anticipating their needs, but the opinion in this district is that shipping and production difficulties similar to those experienced last month will present themselves before the end of September.

The American Bridge Co. will furnish 3500 tons of fabricated steel for Mississippi River Dam No. 21 at Quincy, Ill., while the Blaw-Knox Co. has received an award involving 900 tons of material for transmission towers.

The raw material markets are active, with heavy melting moving up $1 a ton. A Tonawanda blast furnace has closed negotiations for approximately 1500 tons of Beehive coke monthly.

Third quarter prices on pig iron have been reaffirmed for fourth quarter delivery.

### *Pig Iron*

Demand continues to show improvement. The local merchant producer is expected to blow in its Sharpsville furnace some time in the early part of September. This is the second merchant stack in the Mahoning Valley to make plans for resumption of operations, and is indicative of a better demand for pig iron. Meanwhile, pig iron melt continues to increase owing to the firm situation in scrap.

### *Semi-Finished Steel*

A heavy movement of sheet bars to non-integrated mills is in evidence owing to the persistent demand for all grades of sheets. Recent improvement in the wire market is exerting its influence on the ordering of wire rods. Specifications for other semi-finished items remains at the rate of last week.

### *Bolts, Nuts and Rivets*

Further improvement in demand has made its appearance over the past week. Aggregate bookings for August have been wholly as good as those placed in July, and in some cases even better. This week's improvement was noted in both miscellaneous demand and tonnages for 1937 motor car models. Business placed by the railroads remains at recent levels, and there is an indication that orders from this source will show further improvement, since repair programs will be increased during the fall months.

### *Bars*

Further improvement in specifications for hot-rolled bars has been noted during the past week. The increased tonnages are being ordered largely by miscellaneous users. Orders from automobile makers have not increased to any great extent, but a heavy influx from that source is expected within the next few weeks. Implement makers have shown signs of life within the past week. The comparatively light volume of new orders during the early part of August have enabled producers to give a little better delivery service, but the increased rate of specifications within the past week and a half has prevented a heavy work-off of backlogs. Deliveries are running from three to five weeks, depending on the sizes. As yet no definite information has been forthcoming with regard to fourth quarter quotations.

### *Cold-Finished Bars*

Specifications over the past week have shown no change compared with the previous period. Producers feel that some stocking to avoid the July 1 price increase and seasonal curtailment in some lines are responsible for the light demand during August. Backlogs have been worked down to some extent; however, unfilled orders are still sufficient to delay deliveries three to four weeks. Meanwhile, automotive orders are expected soon in larger volume and there is some evidence that the miscellaneous trade will be ordering more freely within the next two weeks.

### *Shapes and Plates*

Plate mills continue to be six to eight weeks behind on deliveries and new specifications are being

# A Comparison of Prices

## Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

### Rails and Semi-finished Steel

| *Per Gross Ton:* | Sept. 1, 1936 | Aug. 25, 1936 | Aug. 4, 1936 | Sept. 4, 1935 |
|---|---|---|---|---|
| Rails, heavy, at mill | $36.37½ | $36.37½ | $36.37½ | $36.37½ |
| Light rails, Pittsburgh | 35.00 | 35.00 | 35.00 | 35.00 |
| Rerolling billets, Pittsburgh | 30.00 | 30.00 | 30.00 | 27.00 |
| Sheet bars, Pittsburgh | 30.00 | 30.00 | 30.00 | 28.00 |
| Slabs, Pittsburgh | 30.00 | 30.00 | 30.00 | 27.00 |
| Forging billets, Pittsburgh | 37.00 | 37.00 | 37.00 | 35.00 |
| Wire rods, Nos. 4 and 5, P'gh | 38.00 | 38.00 | 38.00 | 38.00 |
| | Cents | Cents | Cents | Cents |
| Skelp, grvd. steel, P'gh, lb. | 1.80 | 1.80 | 1.80 | 1.70 |

### Finished Steel

| *Per Lb.:* | Cents | Cents | Cents | Cents |
|---|---|---|---|---|
| Bars, Pittsburgh | 1.95 | 1.95 | 1.95 | 1.80 |
| Bars, Chicago | 2.00 | 2.00 | 2.00 | 1.85 |
| Bars, Cleveland | 2.00 | 2.00 | 2.00 | 1.85 |
| Bars, New York | 2.30 | 2.30 | 2.30 | 2.15 |
| Plates, Pittsburgh | 1.90 | 1.90 | 1.90 | 1.80 |
| Plates, Chicago | 1.95 | 1.95 | 1.95 | 1.85 |
| Plates, New York | 2.19 | 2.19 | 2.19 | 2.09 |
| Structural shapes, Pittsburgh | 1.90 | 1.90 | 1.90 | 1.80 |
| Structural shapes, Chicago | 1.95 | 1.95 | 1.95 | 1.85 |
| Structural shapes, New York | 2.16¼ | 2.16¼ | 2.16¼ | 2.06¼ |
| Cold-finished bars, Pittsburgh | 2.25 | 2.25 | 2.25 | 1.95 |
| Hot-rolled strips, Pittsburgh | 1.95 | 1.95 | 1.95 | 1.85 |
| Cold-rolled strips, Pittsburgh | 2.60 | 2.60 | 2.60 | 2.60 |
| Hot-rolled annealed sheets, No. 24, Pittsburgh | 2.50 | 2.50 | 2.50 | 2.40 |
| Hot-rolled annealed sheets, No. 24, Gary | 2.60 | 2.60 | 2.60 | 2.50 |
| Sheets, galv., No. 24, P'gh | 3.20 | 3.20 | 3.20 | 3.10 |
| Sheets, galv., No. 24, Gary | 3.30 | 3.30 | 3.30 | 3.20 |
| Hot-rolled sheets, No. 10, Pittsburgh | 1.95 | 1.95 | 1.95 | 1.85 |
| Hot-rolled sheets, No. 10, Gary | 2.05 | 2.05 | 2.05 | 1.95 |
| Cold-rolled sheets, No. 20, Pittsburgh | 3.05 | 3.05 | 3.05 | 2.95 |
| Cold-rolled sheets, No. 20, Gary | 3.15 | 3.15 | 3.15 | 3.05 |
| Wire nails, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.40 |
| Wire nails, Chicago dist. mill | 2.15 | 2.15 | 2.15 | 2.45 |
| Plain wire, Pittsburgh | 2.40 | 2.40 | 2.40 | 2.30 |
| Plain wire, Chicago dist. mill | 2.45 | 2.45 | 2.45 | 2.35 |
| Barbed wire, galv., P'gh | 2.60 | 2.60 | 2.60 | 2.80 |
| Barbed wire, galv., Chicago dist. mill | 2.65 | 2.65 | 2.65 | 2.85 |
| Tin plate, 100-lb. box, P'gh | $5.25 | $5.25 | $5.25 | $5.25 |

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

### Pig Iron

| *Per Gross Ton:* | Sept. 1, 1936 | Aug. 25, 1936 | Aug. 4, 1936 | Sept. 4, 1935 |
|---|---|---|---|---|
| No. 2 fdy., Philadelphia | $21.3132 | $21.3132 | $21.3132 | $20.3132 |
| No. 2, Valley furnace | 19.50 | 19.50 | 19.50 | 18.50 |
| No. 2, Southern Cin'ti | 20.2007 | 20.2007 | 20.2007 | 19.2007 |
| No. 2, Birmingham† | 15.88 | 15.88 | 15.50 | 14.50 |
| No. 2, foundry, Chicago* | 19.50 | 19.50 | 19.50 | 18.50 |
| Basic, del'd eastern Pa. | 20.8132 | 20.8132 | 20.8132 | 19.8132 |
| Basic, Valley furnace | 19.00 | 19.00 | 19.00 | 18.00 |
| Malleable, Chicago* | 19.50 | 19.50 | 19.50 | 18.50 |
| Malleable, Valley | 19.50 | 19.50 | 19.50 | 18.50 |
| L. S. charcoal, Chicago | 25.2528 | 25.2528 | 25.2528 | 24.2528 |
| Ferromanganese, seab'd carlots | 75.00 | 75.00 | 75.00 | 85.00 |

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

### Scrap

| *Per Gross Ton:* | | | | |
|---|---|---|---|---|
| Heavy melting steel, P'gh | **$17.25** | $16.25 | $15.50 | $13.25 |
| Heavy melting steel, Phila. | **15.00** | 14.75 | 13.00 | 12.00 |
| Heavy melting steel, Ch'go | 15.75 | 15.75 | 14.25 | 12.50 |
| Carwheels, Chicago | **15.50** | 15.00 | 15.00 | 12.75 |
| Carwheels, Philadelphia | 16.25 | 16.25 | 14.75 | 11.75 |
| No. 1 cast, Pittsburgh | 15.75 | 15.75 | 14.75 | 14.25 |
| No. 1 cast, Philadelphia | 15.75 | 15.75 | 15.00 | 11.75 |
| No. 1 cast, Ch'go (net ton) | 13.50 | 13.50 | 13.00 | 11.00 |
| No. 1 RR. wrot., Phila. | 14.75 | 14.75 | 14.75 | 12.25 |
| No. 1 RR. wrot., Ch'go (net) | 13.75 | 13.75 | 13.00 | 9.50 |

### Coke, Connellsville

| *Per Net Ton at Oven:* | | | | |
|---|---|---|---|---|
| Furnace coke, prompt | $3.65 | $3.65 | $3.50 | $3.25 |
| Foundry coke, prompt | 4.00 | 4.00 | 4.00 | 4.00 |

### Metals

| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
|---|---|---|---|---|
| Electrolytic copper, Conn. | 9.75 | 9.75 | 9.75 | 8.25 |
| Lake copper, New York | 9.87½ | 9.87½ | 9.87½ | 8.62½ |
| Tin (Straits), New York | **43.12½** | 42.10 | 43.00 | 48.62½ |
| Zinc, East St. Louis | **4.85** | 4.80 | 4.80 | 4.60 |
| Zinc, New York | **5.22½** | 5.17½ | 5.17½ | 4.97½ |
| Lead, St. Louis | 4.45 | 4.45 | 4.45 | 4.20 |
| Lead, New York | 4.60 | 4.60 | 4.60 | 4.35 |
| Antimony (Asiatic), N. Y. | 12.50 | 12.50 | 13.00 | 13.00 |

# The Iron Age Composite Prices

| | Finished Steel | Pig Iron | Steel Scrap |
|---|---|---|---|
| **Sept. 1, 1936** | 2.159c. a Lb. | $18.73 a Gross Ton | $16.00 a Gross Ton |
| **One week ago** | 2.159c. | 18.73 | 15.58 |
| **One month ago** | 2.159c. | 18.84 | 14.25 |
| **One year ago** | 2.124c. | 17.84 | 12.58 |
| | Based on steel bars, beams, tank plates, wire rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output. | Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati. | Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago. |

| | Finished Steel High | Finished Steel Low | Pig Iron High | Pig Iron Low | Steel Scrap High | Steel Scrap Low |
|---|---|---|---|---|---|---|
| **1936** | 2.159c., July 7 | 2.084c., Mar. 10 | $18.84, Jan. 7 | $18.73, Aug. 11 | $16.00, Sept. 1 | $12.67, June 9 |
| **1935** | 2.130c., Oct. 1 | 2.124c., Jan. 8 | 18.84, Nov. 5 | 17.83, May 14 | 13.42, Dec. 10 | 10.33, April 23 |
| **1934** | 2.199c., April 24 | 2.008c., Jan. 2 | 17.90, May 1 | 16.90, Jan. 27 | 13.00, Mar. 13 | 9.50, Sept. 25 |
| **1933** | 2.015c., Oct. 3 | 1.867c., April 18 | 16.90, Dec. 5 | 13.56, Jan. 3 | 12.25, Aug. 8 | 6.75, Jan. 3 |
| **1932** | 1.977c., Oct. 4 | 1.926c., Feb. 2 | 14.81, Jan. 5 | 13.56, Dec. 6 | 8.50, Jan. 12 | 6.43, July 5 |
| **1931** | 2.037c., Jan. 13 | 1.945c., Dec. 29 | 15.90, Jan. 6 | 14.79, Dec. 15 | 11.33, Jan. 6 | 8.50, Dec. 29 |
| **1930** | 2.273c., Jan. 7 | 2.018c., Dec. 9 | 18.21, Jan. 7 | 15.90, Dec. 16 | 15.00, Feb. 18 | 11.25, Dec. 9 |
| **1929** | 2.317c., April 2 | 2.273c., Oct. 29 | 18.71, May 14 | 18.21, Dec. 17 | 17.58, Jan. 29 | 14.08, Dec. 3 |
| **1928** | 2.286c., Dec. 11 | 2.217c., July 17 | 18.59, Nov. 27 | 17.04, July 24 | 16.50, Dec. 31 | 13.08, July 2 |
| **1927** | 2.402c., Jan. 4 | 2.212c., Nov. 1 | 19.71, Jan. 4 | 17.54, Nov. 1 | 15.25, Jan. 11 | 13.08, Nov. 22 |

received at a rate which is not helping the shipping situation to any great extent. Structural shapes are being sold on promises of about three to four weeks. American Bridge Co. will fabricate 3500 tons of material for Mississippi dam No. 21 at Quincy, Ill The Blaw-Knox Co., Blawknox, Pa., has received a contract for transmission towers for the Cincinnati Gas & Electric Co., involving 900 tons.

### *Reinforcing Steel*

New orders continue light; the tonnage coming in is mainly for small jobs. A few local projects which will take about 150 tons will be closed within the near future. Producers are still behind on deliveries owing to the heavy demand made on bar mills over the past several weeks. No information is available on fourth quarter prices as yet. The recently inaugurated practice of published quotations has in some measure strengthened the price situation.

### *Steel Sheet Piling*

Demand continues dull with no outstanding inquiries in the past week. Bids on the project involving 470 tons for wharf and dock improvement at Kansas City were rejected owing to being in excess of appropriations. The job will be re-advertised. It is expected that awards on two large dam projects will be announced shortly.

### *Tin Plate*

Demand for general line can material continues to hold up remarkably well. Not only has there been an increase in the amount of tin plate used for such items as beer cans, quart oil cans and paint cans, but a substantial improvement in tonnage ordered by miscellaneous package makers has been noted. Improved business conditions have resulted in greater sales of shoe polish, candy packages, talcum powder, etc. While these are individually small items, aggregate volume of tin plate for such uses has shown up well this year. Packers' specifications continue to level off though demand from the Pacific Coast for fruit and salmon packs is good. There is evidence that the sardine pack will be better this year. Reports also indicate that the pineapple pack will show improvement over 1935. These factors will help to mitigate the loss of tin plate orders attributable to the drought. Operations remain at approximately 90 per cent.

### *Tubular Products*

The steady movement of oil-country goods is largely responsible for the unchanged status in aggregate demand for tubular products. While line pipe has been particularly active this year over 1935, it is not expected that many new projects will evolve during the remainder of the year. The one outstanding job at the present time is the Cabot line which is awaiting decision of the New York State Utility Commission. Specifications at the mills for standard pipe have eased off some, but the movement from jobbers to consumers continues to show improvement. Some stocking in June and July in anticipation of a firmer price structure and the possibility of labor disturbance evidently occurred at some jobbers' warehouses and is the reason for the current leveling off in standard pipe specifications. Producers consider this situation as temporary. Boiler tubes for industrial purposes are moving at recent levels.

### *Wire Products*

There has been no change from the previous week in orders received for manufacturing and merchant wire products. Jobbers' stocks continue to be low and the practice of ordering only when needed still seems to be the habit. Although no announcement with regard to fourth quarter prices has been made as yet, some consideration will probably be given to plans whereby a greater realization on published quotations may be obtained.

### *Strip Steel*

Aggregate demand for both hot and cold-rolled strip has shown a slight improvement over a week ago. Parts makers and in a few cases automobile manufacturers have shown a tendency to increase the amount of tonnage on their orders. Miscellaneous demand continues to move upward. Fair-sized tonnages within the past few weeks have been placed by the furniture manufacturers, and makers of electrical appliances and washing machines have been specifying freely. While backlogs were reduced slightly, owing to lighter demand early in August, the improvement in new specifications in the past two weeks has been sufficient to place backlogs almost where they were at the beginning of August. Delivery of hot-rolled strip is running from two to four weeks and on cold-rolled strip three to five weeks.

### *Sheets*

Mills continue to have backlogs running from four to six weeks and new specifications are being received at a rate which prevents any change in this situation A substantial volume of electrical sheet specifications has been driven in, following the recent price advance of $2 a ton for fourth quarter delivery. Miscellaneous demand is holding up well with jobbers ordering freely, and a considerable amount of tonnage is moving to makers of household appliances. Orders from automobile manufacturers have shown no change within the past week, although a much heavier volume is expected by the middle of September. There is little doubt that delivery problems will be critical before the end of September. Material is being ordered for immediate consumption, and there has been no evidence of speculative buying. In some cases it is probably true that customers are showing a more liberal tendency toward anticipating their needs, which has been brought about entirely by the presence of heavy backlogs.

### *Coal and Coke*

Merchant pig iron furnaces planning to resume operations are finding it difficult to obtain coke. A Tonawanda blast furnace, requiring about 15,000 tons monthly, has completed negotiations for beehive coke. A Sharpsville furnace, which is to resume operations some time this month, will obtain beehive coke from the Tower Hill plant at Connellsville, which has been idle for several years. At the present time all available beehive coke ovens are in use and should demand for this type of coke increase, it will be necessary to resort to ovens which are badly in need of repairs. No substantial program of rebuilding will be embarked upon unless producers are able to get better prices than have been prevalent over the past several months. Meanwhile, both beehive and by-product producers are making some headway on building up dealers' stocks on domestic sizes; however, they are only taking care of old customers. Domestic size coal is moving freely to dealers, and indications are that consumers will pay prices this month equal to the highs of last winter.

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The current revision of simplified practice recommendation R90-29, hack-saw blades, has been accorded the required degree of acceptance by the industry, and is to become effective Oct. 1, according to an announcement by the Division of Simplified Practice, National Bureau of Standards. The revised recommendation will be identified as simplified practice recommendation R90-36.

## . . . . CHICAGO . . . .

***. . . First evidences of car shortages may hasten equipment programs.***

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***. . . Railroads place large orders for track supplies and will buy rails.***

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***. . . Mills expect fall influx of orders may further extend deliveries.***

CHICAGO, Sept. 1.—Finished steel, pig iron and scrap markets are gathering strength, and there is every indication that the start of the fall rush is under way. Some mills have not yet cleared bottlenecks and others are already operating above practical capacity. As demand increases only one thing can happen, and that is deliveries will be extended and steel shortages, such as now exist in semi-finished steel, are bound to become more of a market factor.

Ingot output is firmly fixed at 73 per cent of capacity and both sales and specifications are gaining.

The Santa Fe has ordered over 21,000 tons of track fastenings and other railroads followed suit in order to take advantage of the old prices which disappeared at the end of August. These orders point the way to added rail business and at least one large order, for about 90,000 tons, may drop at any moment.

The railroad equipment field looks exceptionally promising. The first stages of a car shortage are already being felt, and steel producers are certain that many car programs, which have been slowly developing, will be pushed into the market in the early fall. The Kansas City Southern is ready to purchase 1000 freight cars and 10 locomotives and the Chicago & North Western is taking preliminary figures on two seven-car light weight trains.

Except for announcement by Keystone Steel & Wire Co. of a bonus, or profit-sharing plan, and an advance of hourly wages, there are no official moves within the industry on wages. Price structures, except on track supplies, are being left undisturbed as books open for the fourth quarter.

### *Pig Iron*

Nash and Studebaker are hitting full stride on foundry work for 1937 models and automobile foundries in western Michigan are stepping up their melt. Pig iron shipments in August topped those of July by 13 per cent. Books are open for fourth quarter at current prices, but buyers are apprehensive that an advance may come later, and heavy contracting is in the making.

### *Coke*

September deliveries will be made at unchanged quotations of $9 a ton, Chicago ovens. Reflection of the growing melt is given by August shipments, which expanded near the end of the month and brought the total to 5 per cent ahead of July.

### *Sheets*

New business is starting to flow to mills in greater volume and in some cases the shrinkage of order books has been halted. There is no letdown in releases, which are holding mills at near capacity. Sheet producers are keyed up for the rush of 1937 model automobile demand, which has started in a limited way and which will reach large proportions about the middle of the month.

### *Bars*

Mills are being crowded for all classifications and still heavier demand is in sight from the automobile industry. Miscellaneous users are pressing harder for needed supplies and are beginning to sense that the delivery situation promises to grow more unfavorable this fall. There is a larger movement of bars to automobile parts makers, who must lead assembly lines by three to four weeks. The agricultural implement group continues to gain ground slowly and it is careful to point out that the August curtailment of output still left the industry on an unusually high level of production for the eighth month of the year.

### *Plates*

The general run of business remains in good volume and releases by railroads and car builders are excellent. The outlook is particularly good when viewed from the railroad angle. The Chicago & North Western is taking preliminary figures on two seven-car light-weight trains and it has other equipment plans. The Santa Fe is also a potential buyer in the equipment market. In fact, all signs point to the approach of a car shortage, which steel producers believe will lead to a heavy construction movement. The Kansas City Southern is buying 1000 freight cars and 10 locomotives.

### *Wire Products*

Business is steady, with August shipments slightly under the total in July. Output remains close to 60 per cent of capacity, and it probably will climb little, if any, higher because of a shortage of semi-finished steel. August sales by jobbers were the best for any eighth month since 1929, and this record was established in the face of marked damage by drought. Automobile plants and parts makers are taking more wire, but the heavy movement to them will not start for 10 days to two weeks. Reinforcing mesh has had an exceptionally good summer movement, which is now beginning to taper.

### *Structural Material*

There are innumerable small lettings and inquiries of 50 tons and less each. Larger tonnages are scattered and have not contributed much to mill books within the past week. The outstanding private job is 1600 tons let by Allis-Chalmers Mfg. Co. for a plant addition at Springfield, Ill. Bridge tonnages are up in Colorado, Kansas, Idaho, Mississippi and South Dakota.

### *Rails*

The Santa Fe has ordered 21,554 tons of track accessories, about 15,000 tons of which went to the Colorado mill. This railroad may also buy rails upward to 90,000 tons. The above track supply orders are only a few of those which

were rushed to order books in the closing days of August, an urge which was placed on buyers because of the Sept. 1 advance of $3 a ton on spikes and bolts and $2 a ton on tie plates. These new quotations are effective for the remainder of the year and tonnages taken at the old figures are to be completely shipped by the end of September.

### *Reinforcing Bars*

Several 300 to 400-ton private jobs have been placed and others are developing. Among those in prospect are several large apartments for which the promoters are enthusiastic, but for which the money has not been raised. Work on Chicago's lake front calls for 600 tons for the Outer Drive and the Randolph Street viaduct. Most projects require small tonnages, many of which are being used for alterations in the larger types of buildings. Fabricating shops remain very busy and backlogs are of satisfying size.

### *Cast Iron Pipe*

Demand is dragging, though there has been some increase in small tonnage jobs. As sellers look forward they visualize an upturn in September and October in the northern part of the country, where it is customary to rush jobs during the early fall so the pipe can be laid before the ground freezes. Foundry shipments are in good volume and order books are shrinking.

## . . . GERMANY . . .

***. . . Steel deliveries range from 1 to 3 months.***

o o o

***. . . Pig iron and steel output highest since 1928.***

o o o

***. . . Machine tool makers working at nearly 100 per cent.***

HAMBURG, Germany (*Special Correspondence*). — Delivery dates for all iron and steel products have been further extended, as unfilled orders have increased. The steel industry is now operating at 85.5 per cent of capacity compared with 84 per cent last month. Plates cannot be shipped in less than three months. Other products range from four to ten weeks.

The industry's export sales in the first seven months of this year were 31 per cent of all products sold compared with 29.3 per cent last year. The July export figures were 4½ million marks above June and made the best total for any month since 1928.

The Swedish iron and steel industry is working at nearly full capacity and many Swedish works have had to turn down numerous orders, being fully booked. Steel export prices for Scandinavian markets have been advanced by three to five shillings, whereas quotations to the Far Eastern markets have been cut by four to seven shillings per ton to meet Japanese competition. Wire export prices are unaltered. The export demand for wire products is satisfactory.

The German pig iron production in July was 1,311,526 tons compared with 1,241,163 tons in June. Output was the highest for any month since 1928; 107 furnaces are in blast.

Machine-tool makers are working at nearly 100 per cent of capacity. Shipment times for normal machines are up to six months and as high as 12 months for special machines. Export movement is very high. This year's (first half) exports were 30,539 tons, valued at 53.4 million marks, for metalworking machines, compared with 15,724 tons, or 29.1 millions, last year and 2.63 (2.18) millions woodworking machines.

German steel production during July reached 1,721,060 tons compared with 1,631,387 tons in June and 1,302,887 tons in same month last year. This production is the highest total for any month in post-war years, but it must be considered that the Saar production (198,396 tons in July) is included, which was not the case during 1926-1928 when the production was nearly as high. Electric steel production, reaching 32,727 tons in July, however, was the highest output for any month in Germany, exceeding the war figures when Lorraine and Upper-Silesia were included.

The average dividends paid by all German limited companies on shares for 1933 was 1.71 per cent, for 1934, 3.3 per cent, and for 1935, 4.8 per cent. For 1936, it is estimated that the average dividend will be about 5½ per cent. The number of limited companies on shares is decreasing in Germany owing to government intervention, which is favoring private company business.

On July 31 there were in Westfalia, Germany, over 450 companies engaged in steel and hardware production which were established over 150 years ago, among which are nearly 200 companies owned by the same family as 150 years ago.

## REINFORCING STEEL

***. . . Awards of 3315 tons —6735 tons in new projects.***

#### AWARDS

**Cranston, R. I.,** 100 tons, State power plant, to Concrete Steel Co.

**New York,** 210 tons, Department of Sanitation work on Ward's Island, to Fireproof Products Co.

**Cleveland,** 115 tons, Westerly sewage disposal plant, to Patterson-Leitch Co.

**Beardstown, Ill.,** 440 tons, lock on Illinois River, to Carnegie-Illinois Steel Corp.

**Chicago,** 325 tons, Spiegel, May, Stern Co., to Joseph T. Ryerson & Son, Inc.

**Chicago,** 350 tons, Liquid Carbonic Corp., to Joseph T. Ryerson & Son, Inc.

**Chicago,** 300 tons, housing project, to Joseph T. Ryerson & Son, Inc., pending formal award of general contract.

**Riverton, Wyo.,** 230 tons, Bureau of Reclamation project, to Colorado Fuel & Iron Products Co.

**Oakland, Cal.,** 107 tons, Fisher Body Co. factory building, to Gunn, Carle & Co.

**San Jose, Cal.,** 120 tons, five highway bridges on Guadalupe River, to Roccia & Co., San Rafael.

**Denver,** 750 tons, Columbia Basin project, to Gulf States Steel Co.

**Denver,** 135 tons, All-American Canal, to Republic Steel Corp.

#### NEW REINFORCING BAR PROJECTS

**New York,** 225 tons, Treasury Department; Mohawk Steel Co., low bidder.

**New York,** 1100 tons, West Side elevated highway, 98th to 111th Streets; reported last week as 300 tons.

**Chicago,** 400 tons, section of Outer Drive.

**Chicago,** 200 tons, Randolph Street viaduct.

**Menard, Ill.,** 300 tons, penitentiary building; Wullner Construction Co., Alton, Ill., general contractor.

**Reno, Nev.,** 325 tons, Boca Dam on Little Truckee River; bids soon.

**Los Angeles,** 166 tons, reinforcing trusses for Central Avenue bridge floor system; bids Sept. 8.

**Los Angeles,** 135 tons, reinforcing trusses for Glenoaks Boulevard bridge floor system; bids Sept. 10.

**Los Angeles,** 135 tons, reinforcing trusses for Jackson Street bridge floor system; bids Sept. 11.

**Los Angeles,** 6000 tons, post office and courthouse; bids advanced to Sept. 29.

**Los Angeles,** 450 tons, Hayfield pumping plant for Metropolitan Water District; L. E. Dixon and Cast Construction Co., low bidders on general contract.

**Fort Peck, Mont.,** 3575 tons, dam construction; bids opened.

# . . . CLEVELAND . . .

***. . . Delivery situation easing slightly on some products.***

o o o

***. . . Cleveland producer continues pig iron prices into fourth quarter.***

o o o

***. . . No general advance of steel quotations expected at this time.***

CLEVELAND, Sept. 1.—Ingot output in the Cleveland-Lorain district gained two points this week to 78 per cent of capacity. In the Valleys, operations declined two points to 76 per cent of capacity. While the volume of new business was not as heavy during the week as earlier in the month, the tapering off has been only slight, but sufficient to ease up the delivery situation on some products. As a whole, however, deliveries are only slightly better.

Interest is centered in fourth quarter prices. A leading pig iron producer operating several Lake furnaces has reestablished third quarter prices for the coming quarter and made some sales after it opened its books today. No announcement of prices on any steel products for the coming quarter has appeared, but is expected very shortly, as some buyers, particularly in the motor car field, are showing an anxiety about last quarter prices.

Inquiries for sheets for the fourth quarter have come from some of the automotive consumers and considerable tonnage is expected to be placed under contract as soon as prices are named. With the present extended deliveries, considerable buying of other products for the last quarter is also looked for as soon as prices are known. Opinion is divided as to what, if any, price changes will be made. However, it is the more general belief that if there are advances they will be only on minor items. Some look for a continuance of most present prices through the year and a general advance for the first quarter, and, in the meantime, an upward revision of wages. The $2-a-ton advance recently made on electrical sheets by one maker was not placed in effect by other mills, but these mills probably will mark up such sheets for the last quarter.

Generally the miscellaneous demand for finished steel continues good and pressure for deliveries still is in evidence, but not as acute as during the greater part of August. Many consumers are anticipating their requirements by ordering steel further ahead of the time they will need it.

The scrap market continues its upward swing, with activity confined to covering by brokers.

### *Pig Iron*

Naming present prices for the fourth quarter, a leading Lake furnace interest opened its books today for that delivery. This action re-established the market at $19.50 for foundry and malleable grades. While there has been talk of a price advance, it was felt that higher prices would check increase in consumption that is resulting from higher scrap prices and that an advance would tend to increase shipments of foreign pig iron to the Eastern seaboard. Quite a few inquiries have come out for iron for September and last quarter delivery and contracts for considerable tonnage are expected to be closed in the next few days. Sales during the week were confined to small lots to fill out immediate needs. August shipments were about the same as those of July. Orders have fallen off rather sharply from the agricultural implement manufacturers, who are affected by the drought conditions, but this curtailment has been offset by an increase in demand from other sources.

### *Sheets*

New demand continues good, although not as heavy as during previous weeks. A spurt of new orders came from the motor car industry late in the week, but these were for rather small lots. Large-lot purchases by the automobile companies are not expected until they get ready for good production schedules. Business is light from refrigerator manufacturers, who are cleaning up production on this year's models. Demand from railroad and stove manufacturers and from jobbers remains good. While there is no conspicuous improvement in deliveries, some mills can ship cold-rolled sheets and enameling stock in two weeks, which is better than they were able to do earlier in the month. Deliveries of hot-rolled sheets and galvanized and other coated sheets have not improved and some tonnage on the books cannot be shipped until October.

### *Strip Steel*

Some new business in fair-sized lots continues to come from automobile parts plants and miscellaneous demand is fair. However, some of the mills are unable to accumulate much backlog of hot strip and can make shipments in two weeks. Deliveries of cold strip have eased up somewhat, some producers being able to make shipments in four weeks.

### *Bars, Plates and Shapes*

While there is a good miscellaneous demand for bars, the volume of business is being affected by the absence of much tonnage from the automotive industry. Little business is coming from forge shops making automotive parts. Deliveries are a little easier, although they still range from two to four weeks. Structural shapes continue in good demand. Deliveries are slow and show no improvement. Cleveland has placed 500 tons of shapes, reinforcing bars and piling for its westerly sewage disposal plant. Republic Steel Corp. will require 1650 tons of shapes and plates for mill extensions and rebuilding of a Cleveland blast furnace.

## ..BIRMINGHAM..

***...Steel demand still at brisk pace.***

o o o

***...August one of best months of year.***

BIRMINGHAM, Sept. 1.—August proved to be one of the best months of the year for steel buying, with steel rails excepted. All during the month there was a steady flow of new business, which covered all general lines. Bars, plates, shapes and sheets have been moving in large volumes. At the beginning of the month the demand for wire products was not up to expectations, but this improved as the month drew to a close. The usual midsummer lull did not develop this year and the steel market is moving into the fall buying season at full speed. With the marketing of crops, the farming sections will provide additional new demand.

Steel production, with 14 open hearths in operation, is near the high point of the year, and this rate is being sustained. Several mill departments are working on full schedules, and have been for some months. Prospects indicate a continuation of such activity for quite a while yet.

The Ensley rail mill operated last week from Sunday night to Thursday afternoon on an accumulation of small orders. Further operation in the near future is not contemplated at this time.

Three trestles on the line of the Warrior Terminal Co., running from Ensley to Port Birmingham, on the Warrior River, are to be relocated by the United States Engineers. Bids were to be opened Sept. 2, but were postponed last week until Sept. 9. The trestles will require about 300 tons of structural steel and 15 tons of reinforcing bars.

Bids were opened last week on 14 Mississippi state highway projects, which will require about 1077 tons of reinforcing steel and about 800 tons of structural steel.

The pig iron market remains dull, with buying spotty. Contract shipments make up a major part of the movement. August shipments were better than those of July. The base price remains at $15.88.


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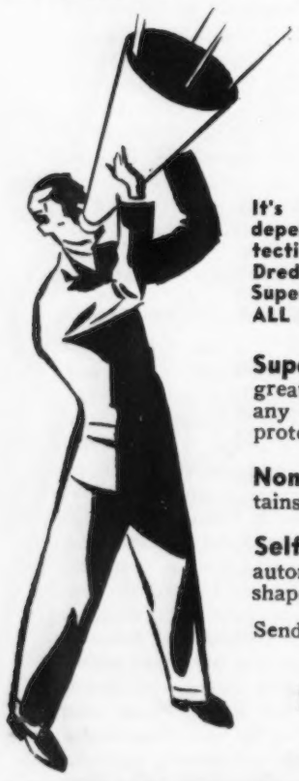

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## ....ST. LOUIS....

***... Bridge over Mississippi to take 10,000 tons.***

o o o

***... General steel demand holds at good rate.***

ST. LOUIS, Sept. 1.—It is expected that bids will be asked shortly for the construction of a bridge across the Mississippi River north of Eads bridge, which it is estimated will require approximately 10,000 tons of structural shapes.

The Wabash Railway has been authorized by the Federal Court to purchase 5000 tons of rails and the necessary fastenings. The Missouri Pacific has ordered 200 40-ton box cars from the Mount Vernon Car Mfg. Co.

The seven fabricators of structural steel in the St. Louis district are operating at about 75 per cent of capacity, the highest rate of production in some time. However, the backlog of orders is small, and, unless new business develops, the rate probably will show a marked drop next month.

Business with the steel mills continues at a fairly active rate. Reinforcing bar demand is light. Demand for structural shapes is fair. Buying of fencing and roofing is light, but bale ties are in good demand.

Warehouse business in August was about on a par with July, which was 40 per cent ahead of July last year. August's gain over the same month last year likely will be close to 40 per cent. The business has been general, no one item being outstanding.

With the opening of books for fourth quarter pig iron business, a strong buying movement is expected. The market is very firm based on good business with the steel mills and foundries, and the nar-

rowing differential between scrap iron and pig iron. Melt is holding up well throughout the district, the extreme heat seemingly affecting only the stove industry, where production is off some on account of the high temperatures. Production in the agricultural implement field has lagged considerably, probably as a result of the drought. However, the demand for tractors in the industrial field is said to be extremely heavy.

**Newton, Mass.,** closed bids Sept. 1 on 330 tons of 12-in. pipe.

**Waterbury, Conn.,** has awarded 128 tons to Donaldson Iron Co. and 120 tons to Warren Foundry & Pipe Corp.

**Manchester, N. H.,** has awarded 150 tons of 8 and 10-in. to Warren Foundry & Pipe Corp.

**Vernon, N. Y.,** plans water pipe line and other waterworks installation. Cost close to $30,000. Financing will be arranged through Federal aid.

**Bogalusa, La.,** closes bids Sept. 14 for 4832 ft. of 6-in., in 16-ft. lengths, for water system. H. E. Willis is city engineer.

**Perry, Okla.,** plans about four miles of large diameter, high-pressure pipe for main water supply, in connection with new dam. Entire project will cost about $220,000, of which $118,000 will be secured through bond issue recently approved. W. R. Holway, 302 East Eighteenth Street, Tulsa, Okla., is consulting engineer.

**Goltry, Okla.,** plans pipe lines for water system. Bonds for $27,000 have been voted for this and other waterworks installation. G. S. Huey, Oklahoma City, Okla., is consulting engineer.

**Town Preble, Brown County, Wis.,** will hold special election Sept. 17 on construction of water system to cost about $181,000. H. R. Albert, 101 North Washington Street, Green Bay, Wis., is consulting engineer.

**Eureka, Kan.,** plans about five miles of pipe for water system; also water purification plant and other waterworks installation. Paulette & Wilson, Farmers' Union Building, Salina, Kan., are consulting engineers.

**Jackson County Public Water District No. 1,** care of Henry M. Beardsley, Bryant Building, Kansas City, Mo., attorney and representative, now being organized, has called meeting Sept. 21 to complete plans for incorporation to build main pipe line for water supply from Kansas City limits to Dallas, Jackson County and vicinity. Cost about $130,000. Financing will be arranged through Federal aid.

**Walnut Creek, Cal.,** plans pipe lines for water system; also 300,000-gal. steel storage tank, pumping machinery and other waterworks equipment. Cost about $90,000, of which $50,000 will be secured by bond issue, recently voted, and remainder through Federal grant. George Oliver is city engineer.

**Manhattan Beach, Cal.,** has authorized about 4100 ft. of 6-in. in part of First Street, and 3700 ft., of 4 and 6-in. in Fisher Hill district for water system, replacing present light steel pipe. Plans are under consideration for 21,000 ft. of 6 and 8-in. for similar replacements in other streets. A new booster pumping station will be installed. W. E. Malcor is water superintendent.

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The Bethlehem Steel Co. has filed with the Securities and Exchange Commission a registration statement covering a bond issue of $55,000,000, of which $20,000,000 is to be set aside for plant improvements, the remainder to be used for refunding operations and other general purposes. The company has not yet announced specifically the future plant improvements that are contemplated.

## Zirconium and Strontium

ZIRCONIUM and strontium, two metals which are but little known to the average man, but which nevertheless have very distinct and important industrial uses, are discussed comprehensively in a booklet published by the Foote Mineral Co., 16th and Summer Streets, Philadelphia. Interestingly illustrated and well written, this 36-page publication includes paragraphs on the history of the metals, their properties, occurrence, applications in industry and an analysis of the various deposits existing throughout the world.


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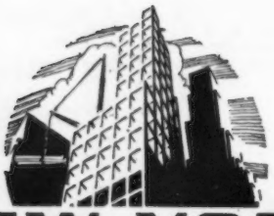

## . . . . NEW YORK. . . .

***. . . Price announcements for fourth quarter not yet issued.***

o o o

***. . . Current prices may remain with only minor changes if any.***

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***. . . General Motors plant at Linden, N. J., will take large steel tonnage.***

NEW YORK, Sept. 1.—With the beginning of the fourth quarter only one month away, the question of prices to be quoted for that period is apparently still undetermined. No announcements have been made as yet by steel companies that have sales offices here, and it now appears that if any changes are made they will be minor ones. Since the expiration of the steel code it has been customary for steel producers to announce their prices at least 30 days prior to a new quarter. At this time, however, the question of prices has been complicated by a number of factors not usually present at one time, namely the demands of some steel workers for wage increases, higher steel-making costs, due chiefly to advances in scrap prices and the expense of vacations granted to steel mill workers, and the present satisfactory condition of steel business, which some companies apparently have no desire to endanger by a general price advance.

The fact that a few steel companies have issued statements that no wage advances are contemplated at this time does not, in the opinion of the trade, dispose of the wage question except perhaps for a brief period. In all probability a final and complete decision has merely been postponed until about the end of the year, if that long. The matter of wages is, of course, tied in very closely with selling prices in that a wage advance undoubtedly would necessitate a general price advance if steel companies expect to continue on the profit side of the ledger. Conversely, a price advance at this time would make it more difficult to postpone definite action on wages until the future course of steel business had been more clearly charted. If by the end of the year the 1937 outlook is as promising as it now appears, the question of both wages and prices can be more intelligently determined.

Meanwhile, the volume of new business is still highly encouraging. For many New York district sales offices August was one of the best, if not the best, month of the year thus far. Orders for some products have dropped off slightly, but the aggregate sales of all products compare favorably with those of previous weeks. The delivery situation is still acute, and steel companies are having a difficult time to satisfy their customers.

The new plant to be erected by General Motors Corp. at Linden, N. J., will require several thousand tons of structural steel. Bids for the first shaft of the new Queens-Midtown tunnel will be received up to Sept. 15, and work on the Queens side will be started within a few weeks thereafter. This project will be financed by a PWA loan of $140,130,000 plus a grant of $11,235,000.

### *Pig Iron*

Books are being opened for fourth quarter today, and no change in prices has been announced. It is understood that producers will go on quoting at the old level. New business in the week just ended was mostly of the carlot variety for prompt shipment. Most sellers noticed some recession in the volume of orders. Inquiry for fourth quarter includes approximately 3000 tons to be bought by a large manufacturer of electrical equipment.

### *Reinforcing Steel*

Although current awards are light, the amount of tonnage on pending jobs continues to mount. More than 5600 tons now awaits disposition in this district. Bids were just taken Tuesday on 1100 tons—required for work on the West Side elevated highway from 98th to 111th Streets. Resale prices have not improved noticeably, heavy shading still being reported.

## . . . BOSTON. . .

***. . . Pig iron outlook is brighter.***

o o o

***. . . New England industry is active.***

BOSTON, Sept. 1.—Quite a few orders for pig iron were placed the past week, but individual tonnages were mostly small and the aggregate only around 1000 tons. With foundries, especially those in Connecticut, operating at a higher rate than in years, and with consumers' stocks of foreign iron rapidly being depleted, the outlook for business with domestic furnaces for fourth quarter is very encouraging. A sizeable increase in pig iron consumption in that period is virtually assured.

Business with New England machine tool builders is holding up remarkably well; small steel fabricating shops have not been so busy in years; electric appliances manufacturers are going strong; automobile parts makers are gradually increasing production, and special machinery manufacturers are quite active.

The Bath Iron Works, Bath, Me., has been awarded a contract for two destroyers, and the Electric Boat Co., Groton, Conn., for three submarines. The destroyers will cost more than $4,000,000 each, and the submarines $2,734,000.

The Warren Foundry & Pipe Corp., Everett, Mass., is operating its plant five days a week, the best showing in two years. The carlot cast iron pipe market is very active.

## ....BUFFALO....

***... Pig iron prices to remain unchanged.***

o o o

***... Steel ingot output at steady level.***

BUFFALO, Sept. 1.—No change is contemplated in last quarter pig iron prices. Furnace men report that their product is moving in steady volume, though the drought affected adversely foundries having to do with the canning industry and with the agricultural implement industry. Automotive foundries are expected to become busy within a short time, and the agricultural implement foundries will start on heavier production in October, but many of these latter plants have considerable stocks on hand that ordinarily should have been disposed of during the summer. Iron is moving principally in small-sized lots, though inquiries for 200, 300 and 400 tons are not exceptional.

For the first time in many weeks no sizeable fabricated structural or reinforcing bar contracts or inquiries are noted, though plenty of small jobs are out to keep the fabricators busy.

The operations of district open hearths remain as before: Lackawanna plant of Bethlehem, 22; Republic, 6, and Wickwire-Spencer, 2.

## ...CINCINNATI...

***... Demand for sheets still heavy.***

o o o

***... Ingot output higher in Southern Ohio.***

CINCINNATI, Sept. 1.—Sheet steel demand continues to amaze district mill operators. Analysis of orders indicates virtually no speculation, consumers closing for material actually needed. Automotive demand for new models has not hit its full stride yet, but specifications from this source are increasing. Other lines—jobbing, stove, refrigerator, tanks and the broad miscellaneous field—are all well represented in current ordering. Production schedules are nearer to demand and rolling mills are at about 85 per cent of capacity output.

Steel making was stepped up four points to about 90 per cent the past week, with two interests operating all open hearths. This brings the total to 30 out of 34 in this district.

Purchasing of pig iron is steady, but orders reflect coverage only for immediate needs. Furnace representatives anticipate an affirmation of present prices for fourth quarter. Foundry operations are unchanged. Melters, however, reporting organization work among employees, are fearful that the present market may become disturbed by labor trouble. The melt continues at good rate. Automotive foundries are increasing their pace, while machine tool foundries are leveling off.

## ..GREAT BRITAIN..

***... English foundry iron shortage at an end.***

o o o

***... British mills booked ahead heavily.***

LONDON, Aug. 31 (by cable).—British iron and steel markets are recovering gradually from the effects of the holiday. Production is being increased in anticipation of a busy autumn. The foundry iron shortage is now completely overcome, but basic and hematite iron remain scarce. Makers are booked heavily ahead.

Despite the recent quieter flow of orders, steel deliveries are still in arrears and most works are heavily booked. Structural steel forms the largest proportion of output, but rail and plate mills are busier than for years and sheet makers are beginning to experience the benefit of the International Cartel owing to the price advances of foreign competitors.

Good home and export sales of tin plate and substantial inquiries have been reported. Output now is slightly below 60 per cent of capacity, but is likely to be increased soon. Unfilled orders are on hand for about 3,500,000 base boxes of tin plate.

Continental iron and steel is active, especially in the export business, and a general export price increase is considered probable in October or even earlier.

## ..SAN FRANCISCO..

***... Dam job calls for 3575 tons of bars.***

o o o

***... Awards light but mills have good backlogs.***

SAN FRANCISCO, Aug. 31.—The highlight of the week's activity was the opening of bids for 3575 tons of 1, 1⅛, and 1¼-in. reinforcing bars for use in the Fort Peck Dam at Fort Peck, Mont. This dam is scheduled to be one of the two largest in the Pacific Northwest.

The date for opening bids on the 16-story Federal Building in Los Angeles, estimated to cost $6,500,000, has been advanced to Sept. 29. The combined post office and courthouse will involve approximately 20,000 tons of structural steel and 6000 tons of reinforcing bars.

With the announcement at Washington that bidding on the construction of a $10,000,000 floating drydock at Pearl Harbor, T. H., will be restricted to the Pacific Coast because of difficulties and expense of transporting the dock from the East through the Panama Canal, it is generally believed that the final award will go to a bidder in the central part of the Coast because of lower transportation costs than from the northern section. Whether it will be built in a government yard or by an individual bidder cannot be determined until final bids are opened.

Aggregate awards for the week were 1585 tons of reinforcing bars and 813 tons of structural steel. Largest single award was 522 tons of structural steel for use in the construction of Nisqualia bridge in Pierce County, Wash., to Pacific Car & Foundry Co. Though no award has yet been announced on the Hayfield pumping plant for the Metropolitan Water District in Los Angles, involving 970 tons of plates and 400 tons of structural steel, L. E. Dixon Co. and Case Construction Co. are low on the general contract.

Announcement of the opening of bids on 436 tons of steel for bridge flooring systems on three bridges in Los Angeles stands out among new projects pending.

Pacific Coast mills are operating principally on a backlog of orders with little activity in either awards or new projects at present.

# . . PHILADELPHIA . .

***. . . Eastern Pennsylvania operating rate unchanged at 55 per cent.***

o o o

***. . . Fourth quarter pig iron and ferromanganese prices unchanged.***

o o o

***. . . Market confused by failure of mills to announce steel prices.***

PHILADELPHIA, Sept. 1.—The first of the month has come and gone but still no mill home office has made a fourth quarter price announcement for finished steel. This failure to follow usual routine has consumers somewhat confused but not particularly worried, for they are still able to enter orders at current price levels. And even though "delivery at mill's convenience" is specified for all new business, most buyers realize that current rolling backlogs preclude shipment in less than six or eight weeks for most products.

Sentiment regarding higher prices has shifted to some extent over the past fortnight. Whereas several weeks ago a general price advance was anticipated, the trade is of the opinion today that advances, if any, will be confined to products such as merchant bars, certain grades of sheets and, perhaps, plates and shapes. Clarification of the entire price issue is expected within the next week. As anticipated, pig iron and ferromanganese prices have been reaffirmed and sellers have books opened for fourth quarter orders.

The Philadelphia area continues to be an active steel outlet. The Pennsylvania Railroad is buying steel steadily for car repairs; shipyards have entered tentative specifications for boats being laid down this month, and local autobody stamping plants and miscellaneous sheet fabricators are swinging into peak seasonal production schedules.

With rolling backlogs showing no decline, mills are not taking off any open-hearth units. No semi-finished steel is being stocked currently. The operating rate for the current week is unchanged at 55 per cent of capacity, as compared with an average rate of 38 per cent a year ago and 18 per cent for the same period in 1934.

### *Sheets*

No mill has yet announced fourth quarter price schedules. Until definite action is made public, books remain open for new business at current quotations even though normal delivery in many cases will extend well into the fourth quarter. Bookings are continuing in unchanged volume and there has been no tendency for mill backlogs to slip. Stove makers are swinging into peak fall production and are steadily purchasing enameling and black sheets. Coal companies and perforators are constantly buying annealed, galvanized and cold-rolled sheets, and warehouses are building up their stocks slightly, but show no inclination to enter heavy protective orders merely on rumors of advancing prices. Both Budd and Heintz are in full fall production of automobile bodies and are on the average protected for steel requirements through September and well into October. Budd is fabricating between 1500 and 2200 tons of Alan Wood plate into Chevrolet frames each week.

### *Pig Iron*

All sellers have opened fourth quarter books at unchanged price levels, namely $21.313, $21.813, and $20.813 for No. 2 foundry, malleable and basic iron respectively. The ferromanganese price of $75, f.o.b. Philadelphia, for carlots of the 80 per cent Mn domestic grade has also been reaffirmed. Sellers' order books have been depleted to some extent by August shipments, but spot demands are expected to come in during the month to maintain deliveries at the level established during August. Stove foundries are more active and jobbing foundries also have advanced their melting schedules now that the weather has moderated. The rapidly rising scrap market has accelerated pig iron sales somewhat and this factor, together with general improved steel demand in August, raised total domestic iron shipments to an estimated 2,711,431 tons, as compared with 2,594,268 tons delivered in July.

### *Shapes and Bars*

The past week was particularly inactive with regard to awards of shapes and reinforcing bars. Although there have been a number of small-tonnage reinforcing jobs placed on mill books, nothing of over 100 tons has been let to district mills. The only large shape job placed was 630 tons with Belmont Iron Works for a Sinclair Refining Co. wharf at Marcus Hook, Pa. A 630-ton Bureau of Printing building at Washington is in the hands of a general contractor and an early steel award is expected, the local Keebler-Weyl Co. bakery building is to be re-bid in the near future, the 4600-ton Phillipsburg bridge will be out about the middle of September and several sizable armories are coming up for bidding during the next two weeks. Otherwise there is little new work in prospect for local fabricators.

### *Imports*

The following iron and steel imports were received here last week: 867 tons of pig iron from the Netherlands; 193 tons of pig iron and 25 tons of ferromanganese from Norway; 4 tons of steel billets, 114 tons of steel tubes, 16 tons of steel forgings, 103 tons of CDS wire and 62 tons of steel bars from Sweden, and 34 tons of steel bars, 26 tons of structural shapes and 3 tons of steel bands from Belgium.

## . . . . PIPE LINES . . . .

**Treadwell Construction Co.**, Midland, Pa., has submitted low bid to United States Engineer Office, St. Paul, Minn., for 24 riveted steel pontoons, each 16 ft. wide, 47.6 ft. long and 2.6 ft. deep, and for 70 pieces of electric welded steel pipe, each 20-in. diameter and 18 ft. long, for suction dredge service, at $72,290.

**Southern Natural Gas Co.**, Cedartown, Ga., is considering welded steel pipe line to point near Chattanooga, Tenn., where connection will be made with lines of Chattanooga Gas Co. Natural gas will be furnished to last noted company for local distribution.

**Texarkana, Tex.**, has engaged Shirley Peters, Southwest Life Building, Dallas, Tex., consulting engineer, to make surveys and plans for natural gas distributing plant and steel pipe lines in different parts

of municipality. Bond issue of $1,200,000 was authorized recently for project.

**El Paso Natural Gas Co.**, El Paso, Tex., has awarded contract to Lea County Gas Construction Co., Silver City, N. M., for welded steel natural gas pipe line from point near Gage, Luna County, N. M., where connection will be made with present pipe line, to Silver City, about 46 miles. Cost over $225,000. Contract also has been let for steel pipe line distribution system at Silver City to Patrick Gratton, El Paso, to cost about $100,000.

**Central Arizona Light & Power Co.**, Phoenix, Ariz., has authorized installation of steel pipe lines at Chandler, Ariz., for natural gas distribution. Cost about $45,000.

**Spokane, Wash.**, will ask bids in fall for 3800 ft. of 36-in. and 11,440 ft. of 30-in. steel pipe for water lines in several streets; also four large motor-driven pumping plants with auxiliaries. Cost $330,000, of which $148,500 is being secured through Federal aid. Alexander Lindsay is superintendent of city water department, in charge.

**White Salmon, Wash.**, plans 10 and 12-in. steel pipe for main water line, about 8 miles, part to be of wood pipe; also new reservoir and other waterworks installation. Financing is being arranged through Federal aid. Beesley & Stoehr, Railway Exchange Building, Portland, Ore., are consulting engineers.

**Des Moines, Wash.**, will ask bids soon for about four miles of 3 to 6-in. steel pipe for main water system; also 50,000-gal. elevated tank. Parker & Hill, Smith Tower Building, Seattle, are consulting engineers.

**Phillips Petroleum Co.**, Bartlesville, Okla., has awarded contract to White Deere Pipe Line Construction Co., Oklahoma City, for about nine miles of Linde-welded pipe, to be laid in connection with a natural gasoline plant to be built near Edmond, Okla.

**Enpire Companies**, Bartlesville, Okla., have awarded contract to J. F. Pritchard Co., Kansas City, for 14 miles of 4-in. Linde-welded steel pipe from its new refinery to Odessa, Tex.; also four miles of 5½-in. pipe and four miles of 16-in., both Linde-welded, for gathering lines.

CANADA

## ...Pig iron production declines.

o o o

## ...New steel business shows a small gain.

TORONTO, Ont., Sept. 1.—As a result of the clean-up of rail contracts, curtailed operations have become effective among some of the Canadian steel mills and pig iron production has fallen off as a result. At the present time three stacks are in blast against four about a month ago. The active furnaces are located as follows: Steel Co. of Canada, Hamilton, one; Algoma Steel Corp., Sault Ste. Marie, Ont., one, and Dominion Steel & Coal Corp., Sydney, N. S., one. Officials of steel companies state that unless new contracts for rails and rolling stock are awarded soon, there will be further reduction in operations in this country. New business for spot delivery has shown minor improvement of late and there is a fair market for many lines of iron and steel materials, especially those going into products for the automotive and mining industry.

New business was steady in the merchant pig iron markets the past week. Melters, however, continue to confine purchases to spot needs and orders mostly are in one and two car lots. Pig iron prices are firm and unchanged.

Trading in iron and steel scrap is spotty and confined to a few special grades. Sales are steady in heavy melting steel, and some good shipments have been made to mills recently, while Montreal dealers also report a good market for heavy melting steel and inquiries for rails and steel axles. Neither Toronto nor Montreal dealers report exports of scrap, but state that the domestic market has been taking all surplus stocks. Iron grades are moving slowly and odd lot sales of machinery cast, malleable and wrought scrap were reported for the week. New offerings are small and dealers state that very little material is being added to yard holdings. Price lists are unchanged.

## Republic Orders Eight Tinning Units

REPUBLIC Steel Corporation has placed a contract with the Aetna-Standard Engineering Co., Youngstown, Ohio, for eight automatic tinning units to be installed at its Niles, Ohio, strip tin plate mill, the capacity of which is to be largely expanded by the addition of four-high cold reducing stands and other equipment. The tin pots will be heated by Kemp-Immersion heating units.

## One Mine to Resume

Thomas Iron Co., wholly owned subsidiary of Reading Iron Co., Philadelphia, will reopen its Richard Mine at Horton, N. J., about Oct. 1 after a shutdown of four years. Work on preparing this mine for operations has already been begun. The ore is high grade magnetite analyzing about 60 to 61.5 per cent iron.

**Electroline Co.**, 4121 South La Salle Street, Chicago, has purchased the H. G. Fiege patents covering the manufacturing and sale of open end, eye end and stud end sockets and turnbuckle assembly, products that are used for holding together the ends of stranded wire rope or cable. They are made for all sizes of wire rope and cables from ¼ to 1 in.


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**SCRAP BALERS**

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**100 TC**

(100 x 51 x 36)

*and other sizes*

*Also Regular*

**Double Ram Presses**

*in all sizes*

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MANUFACTURING COMPANY

2724 S. 31st Street , Milwaukee, Wisconsin

*COMPLETE LINE OF BALERS: Electric and Hydraulic, also HYDRAULIC PRESSES AND PUMPS*

# This Week on the Assembly Line

(CONCLUDED FROM PAGE 55)

gust, oddly enough, showed sales results generally in excess of those of the first 10-day period. . . . Stories here had Nash joining Federal Truck, Hayes Body and Pierce-Arrow in the trailer field. . . . It was reported that Crucible Steel has perfected an alloy for automobile valves which will be adopted by a leading manufacturer, but no confirmation on such an adoption was available in Detroit. . . . July production of passenger cars and trucks in the United States and Canada, according to Department of Commerce statistics, came to a total of 451,474 units, making the month the best July in history, with the exception of 1929. . . . No labor disturbances are anticipated in Detroit in the near future, and Toledo, likewise, anticipates no difficulties. . . . The B. F. Goodrich Co., tire manufacturer, made a move into a new field with the announcement of a new headlight for all types of motor vehicles, claimed to give greater road visibility under all conditions of driving.

**New Automobile Company**

A new name appears on the automotive horizon in the form of Olympic Motor Car, Inc., formed to take over Franklin Motors, Inc., of Syracuse, N. Y. The latter company has existed in name only as the owner of the assets of the H. H. Franklin Mfg. Co., which went into bankruptcy in April, 1933. Olympic Motors, besides planning to produce cars in the "low-priced brackets," intimates that it will also enter the field of air-cooled and air-conditioned refrigeration. In forming the new company, the Doman-Marks Engine Co. of Amesbury, Mass., was purchased and all operations of that company are being transferred to Syracuse. The manufacture of air-cooled industrial and truck engines, formerly marketed under the trade name "Domark," will be continued under the Franklin name.

Olympic Motors will take over the interests of Arthur J. Brandt, Detroit industrial engineer; Alfred R. Glancy, former vice-president of General Motors and an organizer of Franklin Motors, Inc., and John E. Williams, president of Franklin Motors. George W. Ritter of Toledo, vice-president of Franklin, is a director of Olympic Motors. Mr. Brandt is also a former General Motors executive and for a while was vice-president in charge of manufacturing of the Hupp Motor Car Co. Another interested party is Dallas E. Winslow of Detroit and Flint, who has been identified with salvage operations of the former Copeland Products (refrigerators) Co. of Mt. Clemens, Mich.

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# Failing to Make Headway C10 Now Charges Coercion

(CONCLUDED FROM PAGE 61)

a fund for the Steel Workers' Organizing Committee, which is associated with the Committee for Industrial Organization, headed by John L. Lewis. President David Dubinsky of the Garment Workers' Union says it has a membership of 250,000 and it is claimed that $100,000 already has been raised to contribute toward the steel unionization drive. Despite the touted headway of the drive, reports received here indicated that it has made extremely slight inroads toward organizing the steel industry and that leaders of the move do not seriously think it will be successful. It is held to be more important as a political undertaking by way of corralling the voters in the ranks of organized labor, and especially in Pennsylvania, in favor of the New Deal. This move, however, also has been reported to be far from the success claimed for it. Organized labor never has voted as a unit and by no means is expected to do so this year. Probability of its doing so has been further weakened by the split in the ranks of organized labor over the industrial-craft union row.

The row will come definitely to a head Saturday. On that day the 10 unions affiliated with the CIO will be called upon either to disband or be suspended by the Executive Council of the American Federation of Labor on charges of "rebellion." Lewis has repeatedly stated that the CIO will not disband. Hence suspension orders are expected to be issued. Then will follow the convention of the A. F. of L. Nov. 16 in Tampa, Fla., to act on suspension. Suspension requires a two-thirds vote of the Federation. The Garment Workers' Union has informed President Green that it will not withdraw from the CIO "even under threat of suspension."

It is not expected that the Federation will act on the suggestion of President Charles P. Howard of the International Typographical Union that a rank and file referendum be taken to settle the quarrel in the Federation.

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# "Deficiency" Still Exists In Production of Capital Goods

(CONCLUDED FROM PAGE 65)

at the 1925-27 rate. From a weekly standpoint, the production which took place throughout this long period averaged each week only a little better than half of theoretically normal volume. At present a better state of affairs exists, and the weekly records show that so far in 1936 the heavy industries have operated at about 75 per cent of normal. Viewed from a tonnage angle, 1936 production has averaged three-quarters of a ton for each ton produced comparably in the 1925-27 period.

**Kansas City Southern** plans purchase of 10 locomotives, 750 box cars, and 250 gondola cars.

**Missouri Pacific** has ordered 200 40-ton box cars from Mount Vernon Car Co.

**Rio Grande do Sul** (Brazil) may purchase 10 locomotives, 100 stock cars and 300 28-ton box cars. Purchasing agent is Jose Simeao Soerio de Souza, Porto Alegre, Rio Grande do Sul, Brazil.

**Detroit & Toledo Shore Line** is inquiring for three 2-8-2 type locomotives.

**Chicago & North Western** is inquiring for two seven-car light weight alloy steel passenger trains.

**RAILS AND TRACK SUPPLIES**

**Wabash** has been authorized to purchase 5000 tons of rails and necessary fastenings.

**Santa Fe** has ordered 21,554 tons of track supplies.

**Lehigh & New England** has placed 800 tons of 130-lb. rails with Carnegie-Illinois Steel Corp.

# . . .NON-FERROUS. . .

## . . . Zinc prices advance $1 a ton to 4.85c. basis.

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## . . . August copper sales 24,183 tons.

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## . . . Tin market improved; lead continues brisk.

NEW YORK, Sept. 1.—A quiet but steady undertone prevails in copper, and the domestic quotation of 9.75c. a lb. for Connecticut Valley delivery is likely to undergo no further change for the time being. Since certain producers announced plans for increasing production the market has lost some of its bullishness. While the demand for export material is also in lighter volume, the export price has resisted any tendency to ease, and at present is about 9.70c., European ports. Sales yesterday were made at 9.72½c. The month's total domestic bookings up to yesterday were 24,183 tons. Consumption in August, however, was maintained at a very active rate, estimates placing the probable total at about 60,000 tons.

### The Week's Prices. Cents Per Pound for Early Delivery

| | Aug. 26 | Aug. 27 | Aug. 28 | Aug. 29 | Aug. 31 | Sept. 1 |
|---|---|---|---|---|---|---|
| Electrolytic copper, Conn.* | 9.75 | 9.75 | 9.75 | 9.75 | 9.75 | 9.75 |
| Lake copper, N. Y. | 9.87½ | 9.87½ | 9.87½ | 9.87½ | 9.87½ | 9.87½ |
| Straits tin, Spot, New York | 42.50 | 42.62½ | 42.87½ | .... | 43.25 | 43.12½ |
| Zinc, East St. Louis | 4.80 | 4.80 | 4.80 | 4.80 | 4.80 | 4.85 |
| Zinc, New York† | 5.17½ | 5.17½ | 5.17½ | 5.17½ | 5.17½ | 5.22½ |
| Lead, St. Louis | 4.45 | 4.45 | 4.45 | 4.45 | 4.45 | 4.45 |
| Lead, New York | 4.60 | 4.60 | 4.60 | 4.60 | 4.60 | 4.60 |

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.00c.-21.00c. a lb. delivered.
Aluminum, No. 12 remelt No. 2 standard, in carloads, 16.50c. a lb. delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 12.50c. a lb., New York.
Quicksilver, $78.00 to $80.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 9.50c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

### From New York Warehouse

*Delivered Prices, Base per Lb.*

| | |
|---|---|
| Tin, Straits pig | 44.25c. to 45.00c. |
| Tin, bar | 46.25c. to 47.00c. |
| Copper, Lake | 10.75c. to 11.75c. |
| Copper, electrolytic | 10.75c. to 11.75c. |
| Copper, castings | 10.50c. to 11.50c. |
| *Copper sheets, hot-rolled | 17.25c. |
| *High brass sheets | 15.37½c. |
| *Seamless brass tubes | 17.62½c. |
| *Seamless copper tubes | 17.75c. |
| *Brass rods | 13.37½c. |
| Zinc, slabs | 5.75c. to 6.75c. |
| Zinc, sheets (No. 9), casks, 1200 lb. and over | 10.25c. |
| Lead, American pig | 5.10c. to 6.10c. |
| Lead, bar | 6.10c. to 7.10c. |
| Lead, Sheets, cut | 8.25c. |
| Antimony, Asiatic | 13.00c. to 14.00c. |
| Alum., virgin, 99 per cent plus | 23.30c. |
| Alum., No. 1 for remelting, 98 to 99 per cent | 18.50c. to 20.00c. |
| Solder, ½ and ½ | 28.50c. to 29.50c. |
| Babbitt metal, commercial grades | 25.00c. to 60.00c. |

*These prices are also for delivery from Chicago and Cleveland warehouses.

### From Cleveland Warehouse

*Delivered Prices Per Lb.*

| | |
|---|---|
| Tin, Straits pig | 47.25c. |
| Tin, bar | 49.25c. |
| Copper, Lake | 10.50c. to 10.75c. |
| Copper, electrolytic | 10.50c. to 10.75c. |
| Copper, castings | 10.25c. to 10.50c. |
| Zinc, slabs | 6.50c. to 6.75c. |
| Lead, American pig | 5.20c. to 6.50c. |
| Lead, bar | 8.50c. |
| Antimony, Asiatic | 15.50c. |
| Babbitt metal, medium grade | 19.00c. |
| Babbitt metal, high grade | 50.25c. |
| Solder, ½ and ½ | 25.25c. |

### Old Metals, Per Lb., New York

*Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)*

| | Dealers' Buying Prices | Dealers' Selling Prices |
|---|---|---|
| Copper, hvy. crucible | 7.50c. | 8.25c. |
| Copper, hvy. and wire | 7.37½c. | 7.87½c. |
| Copper, light and bottoms | 6.37½c. | 6.87½c. |
| Brass, heavy | 4.25c. | 4.87½c. |
| Brass, light | 3.50c. | 4.25c. |
| Hvy. machine composition | 6.25c. | 6.75c. |
| No. 1 yel. brass turnings | 5.25c. | 5.75c. |
| No. 1 red brass or compos. turnings | 5.87½c. | 6.37½c. |
| Lead, heavy | 3.62½c. | 4.00c. |
| Sheet aluminum | 13.25c. | 14.75c. |
| Zinc | 2.50c. | 2.87½c. |
| Cast aluminum | 12.12½c. | 13.25c. |

### *Tin*

Prices paid for this commodity are considerably advanced over a week ago. The market began improving last midweek, when the news came out that a representative of the Siamese government had embarked for London to resume tin restriction negotiations. By Thursday prices had responded enough to make buyers uneasy, and this culminated in a large volume of business on the day following. The trading was mostly in year-end and first quarter futures. Tin dealers stated that the buying involved both consumers and market operators. Subsequently, there hasn't been much interest shown at the higher price level, which today is in the neighborhood of 43.12½c. a lb., for New York spot Straits tin. American deliveries of tin in August were 5385 tons, lacking two days. The world's visible supply increased by only 915 tons, or less than expected.

### *Zinc*

The market for slab zinc has been raised $1 a ton to the basis of 4.85c. a lb., East St. Louis. Although announcement of a pending change was first heard yesterday, practically all sellers allowed their customers to cover until this morning at the previous 4.80c. level. The buying was heavy, and 15,000 tons is rumored to have been placed under contract yesterday alone. The advance in prices, considering that the zinc market has been fundamentally in a sound position for a considerable time, came as a result of the improved market level abroad. Possibilities of a further domestic mark-up are hinted at, but time in which to study the situation abroad is undoubtedly needed before producers here will risk any further moves.

### *Lead*

Sales of pig lead continued in above normal volume in at least one direction last week, and elsewhere producers were able to move their intake. The business so far this week has been just as good.

### *Non-Ferrous Averages*

| | Aug. aver. |
|---|---|
| Electrolytic copper, Conn. | 9.750c. a lb. |
| Lake copper, Eastern delivery | 9.875c. a lb. |
| Straits tin, spot, N. Y. | 42.573c. a lb. |
| Zinc, East St. Louis | 4.800c. a lb. |
| Zinc, New York | 5.175c. a lb. |
| Lead, St. Louis | 4.450c. a lb. |
| Lead, New York | 4.600c. a lb. |

# IRON AND STEEL SCRAP

***. . . Composite surges up to $16, establishing new high level since Oct. 1, 1929.***

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***. . . Pittsburgh mill purchases No. 1 at $17.50; No. 1 steel on Pennsylvania list may bring $17.75 to $18.***

AFTER a slight period of hesitancy the composite price for scrap has sharply advanced from $15.58 to $16 on the basis of sales at higher price levels at Pittsburgh and a nominal markup in eastern Pennsylvania. There is now only $2.73 between the composite scrap price and the composite pig iron price. This is the narrowest price spread since 1929, when the average difference was $2.13, and in 1916, when the average difference was $2.21. THE IRON AGE records show that at no time has the scrap composite exceeded the figure for pig iron. The paramount market question now is whether precedent will be upset by scrap prices continuing their violent upswing and passing beyond the current $18.73 pig iron composite. Mills are bitterly resisting current high prices and markets over the country show that a waiting game is in progress. Whether brokers or mills will weaken first is currently indeterminable.

The only significant purchase of the week was a tonnage at Pittsburgh which went for $17.50. The trade is looking forward to a price of $17.75 to $18 for No. 1 steel on the Pennsylvania list.

## *Pittsburgh*

Heavy melting steel has been purchased recently at $17.00 and $17.50, and is now quotable in this range. Brokers say that no great tonnage could be obtained even at $17.50 in view of the extremely strong market undertone. Dealers are paying $16.75 and $17.00 to cover. The tonnage involved is negligible. One mill in this district has been offering $17.50 for railroad heavy melting, or equivalent, but so far has been unable to pick up any tonnage. The situation remains tight since brokers are still finding it exceptionally difficult to cover on old orders. While some of them have been fortunate in cleaning up extremely low price orders of a few months ago, there is still a heavy short interest overhanging the market. Further strength has occurred in specialties which have been marked up accordingly.

## *Philadelphia*

The upward swing in prices has been curbed to some extent. Mills and scrap brokers are both playing a waiting game, but the steady market undertone leads to the belief that sellers will wait out the mills and the latter will be forced into the market soon for additional supplies at quoted price levels. It is extremely unlikely that No. 1 steel is obtainable in any sizable quantity under a $15 level and No. 2, while not quite as strong, probably cannot be secured at less than $13.50. The September scrap list of the E. G. Budd Mfg. Co., consisting of 3200 tons of bundles, and about 500 tons of No. 1 and heavy cast, went to the Pencoyd consumer. It is estimated that nearly $14.25 f.o.b. was bid for the bundles, and on this basis the current $15 quotation for No. 1 is in line even though it has recently received no public test.

## *Chicago*

Upward price adjustments continue to appear among the specialties which are moving into consumption as fast as they reach brokers' hands. The market as a whole is strong. Three large railroad offerings of heavy melting steel have sold up to $16.40, delivered, but mills have not paid above $16.00. Railroads have obtained $16.00 for rerolling rails, and brokers are still inclined to bid up on lists as they are offered. Blast furnace grades are moving fast from Chicago docks, several boat loads leaving every week.

## *Cleveland*

Brokers' prices continue to move upward. Steel making grades were advanced 50c. this week and blast furnace scrap 25c. The Youngstown price on steel making scrap has also advanced 50c. While the higher prices are bringing out scrap a little more freely, the supply is not plentiful. No new consumer demand has developed. Activity is confined largely to covering of short sales for delivery to mills in Youngstown where brokers are reported to be paying more than $16 for No. 2 steel. The New York Central Railroad will take bids Sept. 3 for about 8000 tons of scrap. September scrap lists of Michigan automobile companies, which are now out, are comparatively small, owing to the curtailment of automobile production.

## *St. Louis*

An east side steel mill bought 5000 tons of No. 2 steel at the present market. Other mills are expected to come into the market shortly. A scout for a dealer has just returned from Oklahoma and Kansas with the report that the scrap available there is only about 25 per cent of last winter's tonnage. It is reported here that a Birmingham consumer has bought 20,000 tons of scrap from a Northern dealer.

## *Cincinnati*

While district mills have taken some old materials for current use, dealer optimism toward a price advance is being checked by mill refusals to enter future commitments. As a result, some local material is being sent to other areas to take advantage of advancing prices.

## *New York*

Brokers have raised export bids 50c. to 75c. in order to obtain material for shipment on old contracts. That supplies for domestic use are not coming out too freely is evident from the upward price movement in this market also. The prolonged steady rise in prices has gotten some dealers, at least, into difficulties, and short interests are having to buy at a figure above their selling price.

## *Buffalo*

The outstanding sale of the past week involved 2000 tons of the two heavy melting steels at $15 and $14. The mill that purchased this scrap would like to buy more, but none is believed available. Thus, dealers believe, that a $16 price is just around the corner. Some sales of short rails at $17.50 are noted, and some cupola cast has brought $15, Buffalo.

## *Boston*

The scrap market has quieted down somewhat. Prices did not change noticeably during the past week, and movement of heavy melting steel for domestic and foreign consumption was hampered by withdrawal of offerings in anticipation of a further advance in quotations. England has again become an export market factor, 1028 tons of scrap having gone from here to Hull. Steel turnings and bundled skeleton are moving in carload lots to the Pittsburgh territory, and breakable cast to eastern Pennsylvania.

# Iron and Steel Scrap Prices

## PITTSBURGH

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. mltng. steel. | $17.00 to | $17.50 |
| No. 2 hvy. mltng. steel. | 15.75 to | 16.25 |
| No. 2 RR. wrought | 17.00 to | 17.50 |
| Scrap rails | 17.00 to | 17.50 |
| Rails, 3 ft. and under | 19.00 to | 19.50 |
| Comp. sheet steel | 17.00 to | 17.50 |
| Hand bundled sheets | 16.00 to | 16.50 |
| Hvy. steel axle turn. | 15.50 to | 16.00 |
| Machine shop turn. | 12.00 to | 12.50 |
| Short shov. turn. | 12.00 to | 12.50 |
| Mixed bor. & turn. | 11.00 to | 11.50 |
| Cast iron borings | 12.00 to | 12.50 |
| Cast iron carwheels | 16.50 to | 17.00 |
| Hvy. breakable cast | 13.75 to | 14.25 |
| No. 1 cast | 15.50 to | 16.00 |
| RR. knuckles & cplrs. | 19.50 to | 20.00 |
| Rail coil & leaf springs | 19.50 to | 20.00 |
| Rolled steel wheels | 19.50 to | 20.00 |
| Low phos. billet crops | 20.00 to | 20.50 |
| Low phos. sh. bar | 19.50 to | 20.00 |
| Low phos. punchings | 19.00 to | 19.50 |
| Low phos. plate scrap | 19.00 to | 19.50 |
| Steel car axles | 16.50 to | 17.00 |

## CLEVELAND

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. mltng. steel. | $15.00 to | $15.50 |
| No. 2 hvy. mltng. steel. | 14.00 to | 14.50 |
| Comp. sheet steel | 14.50 to | 15.00 |
| Light bund. stampings | 10.00 to | 10.50 |
| Drop forge flashings | 14.00 to | 14.50 |
| Machine shop turn. | 9.50 to | 10.00 |
| Short shov. turn. | 10.00 to | 10.50 |
| No. 1 busheling | 14.00 to | 14.50 |
| Steel axle turnings | 10.50 to | 11.00 |
| Low phos. billet crops | 18.00 to | 18.50 |
| Cast iron borings | 10.00 to | 10.50 |
| Mixed bor. & turn. | 10.00 to | 10.50 |
| No. 2 busheling | 10.00 to | 10.50 |
| No. 1 cast | 15.00 to | 15.50 |
| Railroad grate bars | 9.00 to | 9.50 |
| Stove plate | 9.00 to | 9.50 |
| Rails under 3 ft. | 16.50 to | 17.00 |
| Rails for rolling | 16.50 to | 17.00 |
| Railroad malleable | 17.00 to | 17.50 |
| Cast iron carwheels | | 15.50 |

## PHILADELPHIA

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. mltng. steel. | | $15.00 |
| No. 2 hvy mltng. steel. | | 13.50 |
| Hydraulic bund., new | $14.00 to | 14.50 |
| Hydraulic bund., old | 11.50 to | 12.00 |
| Steel rails for rolling | 15.50 to | 16.00 |
| Cast iron carwheels | 16.00 to | 16.50 |
| Hvy. breakable cast | 15.50 to | 16.00 |
| No. 1 cast | 15.50 to | 16.00 |
| Stove plate (steel wks.) | 12.50 to | 13.00 |
| Railroad malleable | | 16.50 |
| Machine shop turn. | 9.00 to | 9.50 |
| No. 1 blast furnace | 7.50 to | 8.00 |
| Cast borings | 7.50 to | 8.00 |
| Heavy axle turnings | 12.00 to | 12.50 |
| No. 1 low phos. hvy. | 17.50 to | 18.00 |
| Couplers & knuckles | 17.50 to | 18.00 |
| Rolled steel wheels | 17.50 to | 18.00 |
| Steel axles | 17.50 to | 18.00 |
| Shafting | 19.50 to | 20.00 |
| No. 1 RR. wrought | 14.50 to | 15.00 |
| Spec. iron & steel pipe | 12.50 to | 13.00 |
| Bundled sheets | 12.00 to | 12.50 |
| No. 1 forge fire | 13.50 to | 14.00 |
| Cast borings (chem.) | 10.50 to | 13.00 |

## CHICAGO

**Delivered to Chicago district consumers:**

| | *Per Gross Ton* | |
|---|---|---|
| Hvy. mltng. steel | $15.50 to | $16.00 |
| Auto. hvy. mltng. steel. | 13.50 to | 14.00 |
| Shoveling steel | 15.50 to | 16.00 |
| Hydraul. comp. sheets. | 14.50 to | 15.00 |
| Drop forge flashings | 13.50 to | 14.00 |
| No. 1 busheling | 14.75 to | 15.25 |
| Rolled carwheels | 17.50 to | 18.00 |
| Railroad tires cut | 17.50 to | 18.00 |
| Railroad leaf springs | 17.00 to | 17.50 |
| Axle turnings | 14.25 to | 14.75 |
| Steel coup. & knuckles | 18.00 to | 18.50 |
| Coil springs | 18.50 to | 19.00 |
| Axle turn. (elec.) | 14.50 to | 15.00 |
| Low phos. punchings | 18.00 to | 18.50 |
| Low phos. plates, 12 in. and under | 18.00 to | 18.50 |
| Cast iron borings | 9.00 to | 9.50 |
| Short shov. turnings | 9.50 to | 10.00 |
| Machine shop turn. | 8.00 to | 8.50 |
| Rerolling rails | 16.00 to | 16.50 |
| Steel rails under 3 ft. | 17.00 to | 17.50 |
| Steel rails under 2 ft. | 18.00 to | 18.50 |
| Angle bars, steel | 17.50 to | 18.00 |
| Cast iron carwheels | 15.50 to | 16.00 |
| Railroad balleable | 18.00 to | 18.50 |
| Agric. malleable | 15.00 to | 15.00 |
| | *Per Net Ton* | |
| Iron car axles | $18.50 to | $19.00 |
| Steel car axles | 17.75 to | 18.25 |
| No. 1 RR. wrought | 13.75 to | 14.25 |
| No. 2 RR. wrought | $13.75 to | $14.25 |
| No. 2 busheling, old | 6.00 to | 6.50 |
| Locomotive tires | 13.00 to | 13.50 |
| Pipes and flues | 8.50 to | 9.00 |
| No. 1 machinery cast | 13.50 to | 14.00 |
| Clean auto. cast | 12.50 to | 13.00 |
| No. 1 railroad cast | 12.50 to | 13.00 |
| No. 1 agric. cast | 11.00 to | 11.50 |
| Stove plate | 8.50 to | 9.00 |
| Grate bars | 9.50 to | 10.00 |
| Brake shoes | 10.00 to | 10.50 |

## BUFFALO

**Per gross ton, f.o.b. consumers' plants:**

| | | |
|---|---|---|
| No. 1 hvy. mltng. steel. | $14.50 to | $15.50 |
| No. 2 hvy. mltng. steel. | 13.50 to | 14.00 |
| Scrap rails | 14.00 to | 14.50 |
| New hy. b'ndled sheets | 13.50 to | 14.00 |
| Old hydraul. bundles | 12.50 to | 13.00 |
| Drop forge flashings | 13.50 to | 14.00 |
| No. 1 busheling | 13.50 to | 14.00 |
| Hvy. axle turnings | 10.50 to | 11.00 |
| Machine shop turn. | 7.50 to | 8.50 |
| Knuckles & couplers | 17.00 to | 17.50 |
| Coil & leaf springs | 17.00 to | 17.50 |
| Rolled steel wheels | 17.00 to | 17.50 |
| Low phos. billet crops | 17.50 to | 18.00 |
| Short shov. turnings | 9.50 to | 10.00 |
| Mixed Bor. & turn. | 9.00 to | 9.50 |
| Cast iron borings | 9.00 to | 9.50 |
| No. 2 busheling | 10.00 to | 11.00 |
| Steel car axles | 17.00 to | 17.50 |
| Iron axles | 12.00 to | 12.50 |
| No. 1 machinery cast | 15.00 to | 15.50 |
| No. 1 cupola cast | 14.50 to | 15.00 |
| Stove plate | 12.00 to | 12.50 |
| Steel rails under 3 ft. | 17.00 to | 17.50 |
| Cast iron carwheels | 13.00 to | 14.00 |
| Railroad malleable | 17.00 to | 18.00 |
| Chemical borings | 10.50 to | 11.00 |

## BIRMINGHAM

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| Hvy. melting steel | | $11.50 |
| Scrap steel rails | $12.00 to | 12.50 |
| Short shov. turnings | | 8.00 |
| Stove plates | | 8.00 |
| Steel axles | 13.50 to | 14.00 |
| Iron axles | 13.50 to | 14.00 |
| No. 1 RR. wrought | 8.50 to | 9.00 |
| Rails for rolling | 13.50 to | 14.00 |
| No. 1 cast | | 12.50 |
| Tramcar wheels | | 12.00 |

## ST. LOUIS

**Dealers' buying prices per gross ton delivered to consumer:**

| | | |
|---|---|---|
| Selected hvy. steel | $13.75 to | $14.25 |
| No. 1 hvy. melting | 13.25 to | 13.75 |
| No. 2 hvy. melting | 11.50 to | 12.00 |
| No. 1 locomotive tires | 12.00 to | 12.50 |
| Misc. stand.-sec. rails | 14.00 to | 14.75 |
| Railroad springs | 15.00 to | 15.50 |
| Bundled sheets | 9.50 to | 10.00 |
| No. 2 RR. wrought | 13.00 to | 13.50 |
| No. 1 busheling | 8.50 to | 9.00 |
| Cast bor. & turn. | 4.00 to | 4.50 |
| Rails for rolling | 15.00 to | 15.50 |
| Machine shop turn. | 4.00 to | 4.50 |
| Heavy turnings | 9.25 to | 9.75 |
| Steel car axles | 16.00 to | 16.50 |
| Iron car axles | 17.00 to | 17.50 |
| No. 1 RR. wrought | 11.00 to | 11.50 |
| Steel rails under 3 ft. | 15.75 to | 16.25 |
| Steel angle bars | 15.00 to | 15.50 |
| Cast iron carwheels | 11.75 to | 12.25 |
| No. 1 machinery cast | 10.75 to | 11.25 |
| Railroad malleable | 14.50 to | 15.00 |
| No. 1 railroad cast | 11.00 to | 11.50 |
| Stove plate | 7.50 to | 8.00 |
| Agricul. malleable | 12.50 to | 13.00 |
| Grate bars | 9.00 to | 9.50 |
| Brake shoes | 10.00 to | 10.50 |

## CINCINNATI

**Dealers' buying prices per gross ton:**

| | | |
|---|---|---|
| No. 1 hvy. mltng. steel. | $12.25 to | $12.75 |
| No. 2 hvy. mltng. steel. | 9.75 to | 10.25 |
| Scrap rails for mltng. | 12.75 to | 13.25 |
| Loose sheet clippings | 7.00 to | 7.50 |
| Bundled sheets | 9.50 to | 10.00 |
| Cast iron borings | 5.50 to | 6.00 |
| Machine shop turn. | 6.25 to | 6.75 |
| No. 1 busheling | 10.00 to | 10.50 |
| No. 2 busheling | 5.75 to | 6.25 |
| Rails for rolling | 13.00 to | 13.50 |
| No. 1 locomotive tires | 11.00 to | 11.50 |
| Short rails | 15.50 to | 16.00 |
| Cast iron carwheels | 12.50 to | 13.00 |
| No. 1 machinery cast | 13.00 to | 13.50 |
| No. 1 railroad cast | 12.25 to | 12.75 |
| Burnt cast | 8.75 to | 9.25 |
| Stove plates | 8.75 to | 9.25 |
| Agricult. malleable | 11.25 to | 11.75 |
| Railroad malleable | 13.50 to | 14.00 |

## DETROIT

**Dealers' buying prices per gross ton:**

| | | |
|---|---|---|
| No. 1 hvy. mltng. steel. | $13.00 to | $13.50 |
| No. 2 hvy. mltng. steel. | 12.00 to | 12.50 |
| Borings and turnings | 8.00 to | 8.50 |
| Long turnings | $8.25 to | $8.75 |
| Short shov. turnings | 9.00 to | 9.50 |
| No. 1 machinery cast | 14.50 to | 15.00 |
| Automotive cast | 14.50 to | 15.00 |
| Hydraul. comp. sheets. | 13.50 to | 14.00 |
| Stove plates | 8.50 to | 9.00 |
| New factory bushel | 12.00 | 12.50 |
| Old No. 2 busheling | 7.50 to | 8.00 |
| Sheet clippings | 10.00 to | 10.50 |
| Flashings | 11.50 to | 12.00 |
| Low phos. plate scrap | 13.25 to | 13.75 |

## CANADA

**Dealers' buying prices per gross ton:**

| | Toronto | Montreal |
|---|---|---|
| Hvy. melting steel | $7.50 | $7.00 |
| Rails, scrap | 8.50 | 8.00 |
| Machine shop turn. | 4.00 | 4.00 |
| Boiler plate | 7.00 | 6.00 |
| Hvy. axle turnings | 4.50 | 4.00 |
| Cast borings | 5.00 | 4.50 |
| Steel borings | 4.00 | 4.00 |
| Wrought pipe | 4.00 | 4.00 |
| Steel axles | 8.50 | 9.00 |
| Axles, wrought iron | 9.00 | 9.50 |
| No. 1 machinery cast | 11.50 | 11.00 |
| Stove plate | 7.50 | 7.00 |
| Standard carwheels | 11.00 | 10.50 |
| Malleable | 7.00 | 7.00 |
| Shoveling steel | 6.50 | 6.00 |
| Bushelings | 6.00 | 5.58 |
| Compressed sheets | 6.50 | 6.00 |

## YOUNGSTOWN

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. mltng. steel. | $16.50to | $17.00 |
| Hydraulic bundles | 16.00 to | 16.50 |
| Machine shop turn. | 11.50 to | 12.00 |

## NEW YORK

**Dealers' buying prices per gross ton:**

| | | |
|---|---|---|
| No. 1 hvy. mltng. steel. | $10.50 to | $11.00 |
| No. 2 hvy. mltng. steel. | 9.50 to | 10.00 |
| Hvy. breakable cast. | 11.50 to | 12.00 |
| No. 1 machinery cast. | 11.50 to | 12.00 |
| No. 2 cast | 9.75 to | 10.25 |
| Stove plate | 8.50 to | 9.00 |
| Steel car axles | 15.00 to | 16.00 |
| Shafting | 14.50 to | 15.00 |
| No. 1 RR. wrought | 11.50 to | 12.00 |
| No. 1 wrought long | 10.50 to | 11.00 |
| Spec. iron & steel pipe | 10.50 to | 11.00 |
| Forge fire | 8.00 to | 8.50 |
| Rails for rolling | 11.00 to | 11.50 |
| Short shov. turnings | 5.75 to | 6.25 |
| Machine shop turn. | 5.75 to | 6.25 |
| Cast borings | 5.75 to | 6.25 |
| No. 1 blast furnace | 4.00 to | 5.00 |
| Cast borings (chem.) | 10.00 to | 11.00 |
| Unprepar. yard scrap | 6.00 to | 6.50 |

**Per gross ton, delivered local foundries:**

| | | |
|---|---|---|
| No. 1 machn. cast | $12.50 to | $13.00 |
| No. 1 hvy. cast cupola | 10.00 to | 11.00 |
| No. 2 cast | 8.50 to | 9.00 |

**Add 25c. to 50c. to above quotations to secure North Jersey prices.**

## BOSTON

**Dealers' buying prices per gross ton:**

| | | |
|---|---|---|
| No. 1 hvy. mltng. steel. | $9.90 to | $10.40 |
| Scrap rails | 9.90 to | 10.40 |
| No. 2 steel | 8.90 to | 9.40 |
| Breakable cast | 9.50 to | 10.00 |
| Machine shop turn. | | 4.90 |
| Bund. skeleton long | | 8.90 |
| Shafting | 14.00 to | 14.25 |
| Cast bor. chemical | 5.00 to | 7.00 |

**Per gross ton delivered consumers' yards:**

| | | |
|---|---|---|
| Textile cast | $11.50 to | $12.50 |
| No. 1 machine cast | 11.50 to | 12.50 |
| Stove plate | | 9.00 |

## EXPORT

**Brokers' buying prices per gross ton:**

| | | |
|---|---|---|
| ***New York, delivered alongside barges*** | | |
| No. 1 hvy. mltng. steel. | $11.25 to | $11.50 |
| No. 2 hvy. mltng. steel. | 10.25 to | 10.50 |
| No. 2 cast | 9.50 to | 10.00 |
| Stove plate | 8.50 to | 9.00 |
| Rails (scrap) | 10.50 to | 11.00 |
| ***Boston, on cars at Army Base or Mystic Wharf*** | | |
| No. 1 hvy. mltng. steel. | | $12.00 |
| No. 2 hvy. mltng steel. | | 11.00 |
| Rails (scrap) | $12.00 to | 12.25 |
| Stove plate | | 7.75 |
| Machine shop turn. | | 5.75 |
| ***New Orleans, on cars at Stuyvesant Dock*** | | |
| No. 1 hvy. mltng. steel. | $10.00 to | $10.50 |
| No. 2 hvy. mltng. steel. | 9.00 to | 9.50 |
| ***Los Angeles, on cars or trucks at local piers*** | | |
| No. 1 hvy. mltng. steel. | $10.50 to | $11.00 |
| Compressed bundles | 8.50 to | 9.00 |

# PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

## SEMI-FINISHED STEEL

### Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

| | *Per Gross Ton* |
|---|---|
| Rerolling | $30.00 |
| Forging quality | 37.00 |

### Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

| | *Per Gross Ton* |
|---|---|
| Open-hearth or Bessemer | $30.00 |

### Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

| | *Per Lb.* |
|---|---|
| Grooved, universal and sheared | 1.80c. |

### Wire Rods

(Nos. 4 and 5)

| | *Per Gross Ton* |
|---|---|
| F.o.b. Pittsburgh or Cleveland | $38.00 |
| F.o.b. Chicago, Youngstown or Anderson, Ind. | 39.00 |
| F.o.b. Worcester, Mass. | 40.00 |
| F.o.b. Birmingham | 41.00 |
| F.o.b. San Francisco | 47.00 |
| F.o.b. Galveston | 44.00 |

## BARS, PLATES, SHAPES

### Iron and Steel Bars

*Soft Steel*

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 1.95c. |
| F.o.b. Chicago or Gary | 2.00c. |
| F.o.b. Duluth | 2.10c. |
| Del'd Detroit | 2.10c. |
| F.o.b. Cleveland | 2.00c. |
| F.o.b. Buffalo | 2.05c. |
| Del'd Philadelphia | 2.26c. |
| Del'd New York | 2.30c. |
| F.o.b. Birmingham | 2.10c. |
| F.o.b. cars dock Gulf ports | 2.35c. |
| F.o.b. cars Pacific ports | 2.50c. |

*Rail Steel*

(For merchant trade)

| | |
|---|---|
| F.o.b. Pittsburgh | 1.80c. |
| F.o.b. Cleveland, Chicago, Gary or Moline, Ill. | 1.85c. |
| F.o.b. Buffalo | 1.90c. |
| F.o.b. Birmingham | 1.95c. |
| F.o.b. cars dock Gulf ports | 2.20c. |
| F.o.b. cars dock Pacific ports | 2.35c. |

*Billet Steel Reinforcing*

(Straight lengths as quoted by distributors)

| | |
|---|---|
| F.o.b. Pittsburgh | 2.05c. |
| F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham | 2.10c. |
| Del'd Detroit | 2.20c. |
| F.o.b. cars dock Gulf ports | 2.45c. |
| F.o.b. cars dock Pacific ports | 2.45c. |

*Rail Steel Reinforcing*

(Straight lengths as quoted by distributors)

| | |
|---|---|
| F.o.b. Pittsburgh | 1.90c. |
| F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham | 1.95c. |
| F.o.b. cars dock Gulf ports | 2.30c. |
| F.o.b. cars dock Pacific ports | 2.30c. |

*Iron*

| | |
|---|---|
| F.o.b. Chicago | 1.80c. |
| F.o.b. Pittsburgh (refined) | 2.10c. |
| Delivered New York | 2.05c. |
| Delivered Philadelphia | 2.10c. |

### Cold Finished Bars and Shafting*

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 2.25c. |
| F.o.b. Cleveland, Chicago and Gary | 2.30c. |
| F.o.b. Buffalo | 2.35c. |
| Del'd Detroit | 2.40c. |
| Del'd eastern Michigan | 2.45c. |

*In quantities of 10,000 to 19,999 lb.

### Plates

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 1.90c. |
| F.o.b. Chicago or Gary | 1.95c. |
| Del'd Cleveland | 2.095c. |
| F.o.b. Coatesville or Spar. Pt. | 2.00c. |
| Del'd Philadelphia | 2.09c. |
| Del'd New York | 2.19c. |
| F.o.b. Birmingham | 2.05c. |
| F.o.b. cars dock Gulf ports | 2.30c. |
| F.o.b. cars dock Pacific ports | 2.45c. |
| Wrought iron plates, f.o.b. Pittsburgh | 3.20c. |

### Floor Plates

| | |
|---|---|
| F.o.b. Pittsburgh | 3.45c. |
| F.o.b. Chicago | 3.50c. |
| F.o.b. Coatesville | 3.55c. |
| F.o.b. cars dock Gulf ports | 3.85c. |
| F.o.b. cars dock Pacific ports | 4.00c. |

### Structural Shapes

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 1.90c. |
| F.o.b. Chicago | 1.95c. |
| Del'd Cleveland | 2.095c. |
| F.o.b. Buffalo or Bethlehem | 2.00c. |
| Del'd Philadelphia | 2.115c. |
| Del'd New York | 2.1625c. |
| F.o.b. Birmingham (standard) | 2.05c. |
| F.o.b. cars dock Gulf ports | 2.30c. |
| F.o.b. cars dock Pacific ports | 2.45c. |

### Steel Sheet Piling

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 2.25c. |
| F.o.b. Chicago or Buffalo | 2.35c. |
| F.o.b. cars dock Gulf or Pacific Coast ports | 2.70c. |

## RAILS AND TRACK SUPPLIES

### F.o.b. Mill

| | |
|---|---|
| Standard rails, heavier than 60 lb per gross ton | $36.37½ |
| Angle bars, per 100 lb. | 2.55 |

### F.o.b. Code Basing Points

| | |
|---|---|
| Light rails (from billets) per gross ton | $35.00 |
| Light rails (from rail steel) per gross ton | 34.00 |

| | *Base per 100 Lb.* |
|---|---|
| Spikes | 2.70c. |
| Tie plates, steel | 2.00c. |
| Tie plates, Pacific Coast ports | 2.10c. |
| Track bolts, to steam railroads | 3.70c. |
| Track bolts, to jobbers, all sizes (per 100 counts) | 70 per cent off list |

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va.

## SHEETS, STRIP, TIN PLATE, TERNE PLATE

### Sheets

*Hot Rolled*

| | *Base per Lb.* |
|---|---|
| No. 10, f.o.b. Pittsburgh | 1.95c. |
| No. 10, f.o.b. Gary | 2.05c. |
| No. 10, del'd Detroit | 2.15c. |
| No. 10, del'd Philadelphia | 2.26c. |
| No. 10, f.o.b. Birmingham | 2.10c. |
| No. 10, f.o.b. cars dock Pacific ports | 2.50c. |

*Hot-Rolled Annealed*

| | |
|---|---|
| No. 24, f.o.b. Pittsburgh | 2.50c. |
| No. 24, f.o.b. Gary | 2.60c. |
| No. 24, del'd Detroit | 2.70c. |
| No. 24, del'd Philadelphia | 2.81c. |
| No. 24, f.o.b. Birmingham | 2.65c. |
| No. 24, f.o.b. cars dock Pacific ports | 3.15c. |
| No. 24, wrought iron, Pittsburgh | 4.30c. |

*Heavy Cold-Rolled*

| | |
|---|---|
| No. 10 gage, f.o.b. Pittsburgh | 2.60c. |
| No. 10 gage, f.o.b. Gary | 2.70c. |
| No 10 gage, f.o.b. Detroit | 2.80c. |
| No. 10 gage, del'd Philadelphia | 2.91c. |
| No. 10 gage, f.o.b. Birmingham | 2.75c. |
| No. 10 gage, f.o.b. cars dock Pacific ports | 3.20c. |

*Light Cold-Rolled*

| | |
|---|---|
| No. 20 gage, f.o.b. Pittsburgh | 3.05c. |
| No. 20 gage, f.o.b. Gary | 3.15c. |
| No. 20 gage, del'd Detroit | 3.25c. |
| No. 20 gage, del'd Philadelphia | 3.36c. |
| No. 20 gage, f.o.b. Birmingham | 3.20c. |
| No. 20 f.o.b. cars dock Pacific ports | 3.60c. |

*Galvanized Sheets*

| | |
|---|---|
| No. 24 gage, f.o.b. Pittsburgh | 3.20c. |
| No. 24, f.o.b. Gary | 3.30c. |
| No. 24, del'd Philadelphia | 3.51c. |
| No. 24, f.o.b. Birmingham | 3.35c. |
| No. 24, f.o.b. cars dock Pacific ports | 3.80c. |
| No. 24, wrought iron, Pittsburgh | 4.95c. |

### Electrical Sheets

*(F.o.b. Pittsburgh)*

| | *Base per Lb.* |
|---|---|
| Field grade | 2.90c. |
| Armature | 3.25c. |
| Electrical | 3.75c. |
| Special Motor | 4.80c. |
| Special Dynamo | 5.50c. |
| Transformer | 6.00c. |
| Transformer Special | 7.00c. |
| Transformer Extra Special | 7.50c. |

*Silicon Strip in coils—Sheet price plus silicon sheet extra width extras, plus 25c. per 100 lb. for coils.*

*Long Ternes*

| | |
|---|---|
| No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh | 3.50c. |
| F.o.b. Gary | 3.60c. |
| F.o.b. cars dock Pacific ports | 4.20c. |

*Vitreous Enameling Stock*

| | |
|---|---|
| No. 20, f.o.b. Pittsburgh | 3.05c. |
| No. 20, f.o.b. Gary | 3.15c. |
| No. 20, f.o.b. Birmingham | 3.65c. |
| No. 20, f.o.b. cars dock Pacific ports | 3.65c. |

*Tin Mill Black Plate*

| | |
|---|---|
| No. 28, f.o.b. Pittsburgh | 2.75c |
| No. 28, Gary | 2.85c |
| No. 28, cars dock Pacific ports | 3.35c. |

### Tin Plate

| | *Base per Box* |
|---|---|
| Standard cokes, f.o.b. Pittsburgh district mill | $5.25 |
| Standard cokes, f.o.b. Gary | 5.35 |
| Standard cokes, f.o.b. cars dock Pacific ports | 5.90 |

### Terne Plate

*(F.o.b. Pittsburgh)*

(Per Package, 20 x 28 in.)

| | |
|---|---|
| 8-lb. coating I.C. | $10.00 |
| 15-lb. coating I.C. | 12.00 |
| 20-lb. coating I.C. | 13.00 |
| 25-lb. coating I.C. | 14.00 |
| 30-lb. coating I.C. | 15.25 |
| 40-lb. coating I.C. | 17.50 |

### Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

| | *Base per Lb.* |
|---|---|
| All widths up to 24 in., Pgh. | 1.95c. |
| All widths up to 24 in., Chicago | 2.05c. |
| All widths up to 24 in., del'd Detroit | 2.15c. |
| All widths up to 24 in., Birmingham | 2.10c. |
| Cooperage stock, Pittsburgh | 2.05c. |
| Cooperage stock, Chicago | 2.15c. |

### Cold-Rolled Strips*

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 2.60c. |
| F.o.b. Cleveland | 2.60c. |
| Del'd Chicago | 2.895c. |
| F.o.b. Worcester | 2.80c. |

* Carbon 0.25 and less.

### Cold-Rolled Spring Steel

| | Pittsburgh and Cleveland | Worcester |
|---|---|---|
| Carbon 0.25-0.50% | 2.60c. | 2.80c. |
| Carbon .51- .75 | 3.45c. | 3.65c. |
| Carbon .76-1.00 | 4.95c. | 5.15c. |
| Carbon Over 1.00 | 6.50c. | 6.70c. |

*Fender Stock*

| | |
|---|---|
| No. 14, Pittsburgh or Cleveland | 2.90c. |
| No. 14, Worcester | 3.30c. |
| No. 20, Pittsburgh or Cleveland | 3.30c. |
| No. 20, Worcester | 3.70c. |

## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

*To Manufacturing Trade*

| | *Per Lb.* |
|---|---|
| Bright wire | 2.40c. |
| Spring wire | 3.05c. |

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

*To the Trade*

| | *Base per Keg* |
|---|---|
| Standard wire nails | $2.10 |
| Smooth coated nails | 2.10 |

| | *Base per 100 Lb.* |
|---|---|
| Annealed fence wire | $2.65 |
| Galvanized fence wire | 3.00 |
| Polished staples | 2.80 |
| Galvanized staples | 3.05 |
| Barbed wire, galvanized | 2.60 |
| Twisted barbless wire | 2.60 |
| Woven wire fence, base column | 58 |
| Single loop bale ties, base column | 51 |

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

## STEEL AND WROUGHT IRON PIPE AND TUBING

### Welded Pipe

**Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills**

F.o.b. Pittsburgh only on wrought iron pipe.

*Butt Weld*

| *Steel* In. | Black | Galv. | *Wrought Iron* In. | Black | Galv. |
|---|---|---|---|---|---|
| ⅛ | .....57 | 37 | ⅛ | ..+91½ | +138 |
| ¼ to ⅜ | .60 | 44½ | ¼ & ⅜ | +1½ | +21½ |
| ½ | .....64½ | 55 | ½ | .....31½ | 15 |
| ¾ | .....67½ | 59 | ¾ | .....36½ | 20½ |
| 1 to 3 | ...69½ | 61½ | 1 & 1¼ | .39½ | 25½ |
| | | | 1½ | .....43½ | 28 |
| | | | 2 | .....41½ | 26 |

*Lap Weld*

| | | | | | |
|---|---|---|---|---|---|
| 2 | .....62 | 53½ | 2 | .....37 | 22½ |
| 2½ to 3.65 | | 56½ | 2½ to 3½ | 38 | 25 |
| 3½ to 6.67 | | 58½ | 4 to 8 | ...40 | 28½ |
| 7 & 8.66 | | 56½ | 9 to 12 | ..38 | 24½ |
| 9 & 10.65½ | | 56 | | | |
| 11 & 12.64½ | | 55 | | | |

*Butt Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| ⅛ | .....55½ | 42½ | ⅛ | ...+13 | +45½ |
| ¼ to ⅜ | .57½ | 46½ | ¼ & ⅜ | +2½ | +34½ |
| ½ | .....62½ | 54½ | ½ | .....32½ | 17½ |
| ¾ | .....66½ | 58½ | ¾ | .....37½ | 22½ |
| 1 to 3 | ...68 | 61 | 1 to 2 | ..43½ | 29 |

*Lap Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| 2 | .....60 | 52½ | 2 | .....40 | 26 |
| 2½ to 3.64 | | 56½ | 2½ to 4.45½ | | 33 |
| 3½ to 6.67½ | | 60 | 4½ to 6.45 | | 33½ |
| 7 & 8. | .66½ | 57 | 7 & 8 | .46 | 33 |
| 9 & 10. | .65½ | 56 | 9 to 12.41½ | | 30 |
| 11 & 12. | .64½ | 55 | | | |

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

### Boiler Tubes

*Seamless Steel Commercial Boiler Tubes and Locomotive Tubes*

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

| | | Cold Drawn | Hot Rolled |
|---|---|---|---|
| 1 in. o.d. | 13 B.W.G. | $ 8.60 | $ 7.82 |
| 1¼ in. o.d. | 13 B.W.G. | 10.19 | 9.26 |
| 1½ in. o.d. | 13 B.W.G. | 11.26 | 10.23 |
| 1¾ in. o.d. | 13 B.W.G. | 12.81 | 11.64 |
| 2 in. o.d. | 13 B.W.G. | 14.35 | 13.04 |
| 2¼ in. o.d. | 13 B.W.G. | 16.00 | 14.54 |
| 2¼ in. o.d. | 12 B.W.G. | 17.61 | 16.01 |
| 2½ in. o.d. | 12 B.W.G. | 19.29 | 17.54 |
| 2¾ in. o.d. | 12 B.W.G. | 20.45 | 18.59 |
| 3 in. o.d. | 12 B.W.G. | $21.45 | $19.50 |
| 4½ in. o.d. | 10 B.W.G. | 41.08 | 37.35 |
| 3½ in. o.d. | 11 B.W.G. | 27.09 | 24.62 |
| 4 in. o.d. | 10 B.W.G. | 33.60 | 30.54 |
| 4½ in. o.d. | 10 B.W.G. | 41.08 | 37.35 |
| 5 in. o.d. | 9 B.W.G. | 51.56 | 46.87 |
| 6 in. o.d. | 7 B.W.G. | 79.15 | 71.90 |

Extra for less-carload quantities:

| | |
|---|---|
| 25,000 lb. or ft. to 39,999 lb. or ft. | 5 % |
| 12,000 lb. or ft. to 24,999 lb. or ft. | 12½ % |
| 6,000 lb. or ft. to 11,999 lb. or ft. | 25 % |
| 2,000 lb. or ft. to 5,999 lb. or ft. | 35 % |
| Under 2,000 lb. or ft. | 50 % |

## CAST IRON WATER PIPE

*Per Net Ton*

| | |
|---|---|
| *6-in. and larger, del'd Chicago. | $48.40 |
| 6-in. and larger, del'd New York | 45.20 |
| *6-in. and larger, Birmingham | 40.00 |
| 6-in. and larger, f.o.b. dock, San Francisco or Los Angeles | 48.00 |
| F.o.b. dock, Seattle | 40.50 |
| F.o.b. dock, Seattle | 51.50 |

Class "A" and gas pipe, $3 extra.
4-in. pipe is $3 a ton above 6-in.

* Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39, Birmingham, and $47.40, delivered Chicago and 4-in. pipe, $42, Birmingham, and $50.40 a ton, delivered Chicago.

## BOLTS, NUTS, RIVETS, SET SCREWS

### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

*Per Cent Off List*

| | |
|---|---|
| Machine and carriage bolts: | |
| ½ in. x 6 in. and smaller | 70 and 10 |
| Larger than ½ in. | 70 and 5 |
| Lag bolts | 70 and 5 |
| Plow bolts, Nos. 1, 2, 3, and 7 heads | 70 and 5 |
| Hot-pressed nuts, blank or tapped, square | 70 and 5 |
| Hot-pressed nuts, blank or tapped, hexagon | 70 and 5 |
| C.p.c. and t. square or hex. nuts, blank or tapped | 70 and 5 |
| Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes | 60, 20 and 10 |
| Stove bolts in packages, nuts attached | 75 |
| Stove bolts in packages, with nuts separate | 75 and 5 |
| Stove bolts in bulk | 82½ |
| Tire bolts | 50 and 5 |

On stove bolts freight is allowed to destination on 200 lb. and over.

### Large Rivets

(½-in. and larger)

*Base per 100 Lb.*

| | |
|---|---|
| F.o.b. Pittsburgh or Cleveland | $3.05 |
| F.o.b. Chicago or Birmingham | 3.15 |

### Small Rivets

(7/16-in. and smaller)

*Per Cent Off List*

| | |
|---|---|
| F.o.b. Pittsburgh | 70 and 5 |
| F.o.b. Cleveland | 70 and 5 |
| F.o.b. Chicago and Birm'g'm. | 70 and 5 |

### Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

*Per Cent Off List*

| | |
|---|---|
| Milled cap screws, 1 in. dia. and smaller | 80, 10 and 10 |
| Milled standard set screws, case hardened, 1 in. dia. and smaller | 75 |
| Milled headless set screws, cut thread ¾ in. and smaller | 75 |
| Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller | 85 |
| Upset set screws, cut and oval points | 75 and 10 |
| Milled studs | 65 to 65 and 10 |

# Alloy and Stainless Steel

### Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $51 a gross ton.

### Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

| | |
|---|---|
| Open-hearth grade, base | 2.55c. |
| Delivered price at Detroit is | 2.70c. |

| S.A.E. Series Numbers | Alloy Differential per 100 lb. |
|---|---|
| 2000 (½% Nickel) | $0.25 |
| 2100 (2½% Nickel) | 0.95 |
| 2300 (3½% Nickel) | 1.50 |
| 2500 (5% Nickel) | 2.25 |
| 3100 Nickel Chromium | 0.55 |
| 3200 Nickel Chromium | 1.35 |
| 3300 Nickel Chromium | 3.80 |
| 3400 Nickel Chromium | 3.20 |
| 4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum) | 0.50 |
| 4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum) | 0.70 |
| 4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel) | 1.05 |
| 5100 Chromium Steel (0.60 to 0.90 Chromium) | 0.35 |
| 5100 Chromium Steel (0.80 to 1.10 Chromium) | 0.45 |
| 5100 Chromium Spring Steel | base |
| 6100 Chromium Vanadium Bar | 1.10c. |
| 6100 Chromium Vanadium Spring Steel | 0.70 |
| Chromium Nickel Vanadium | 1.40 |
| Carbon Vanadium | 0.85 |

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

### Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.05c. base per lb. Delivered Detroit, 3.20c.

## STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% Ni, 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

| | *Per Lb.* |
|---|---|
| Forging billets | 19.55c. |
| Bars | 23c. |
| Plates | 26c. |
| Structural shapes | 23c. |
| Sheets | 33c. |
| Hot-rolled strip | 20¾c. |
| Cold-rolled strip | 27c. |
| Drawn wire | 23c. |

## TOOL STEEL

| | *Base per Lb.* |
|---|---|
| High speed | 57½c. |
| High carbon chrome | 37c. |
| Oil hardening | 21c. |
| Special | 19c. |
| Extra | 15¾c. |
| Regular | 12½c. |

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

# British and Continental

## BRITISH

**Per Gross Ton**
**f.o.b. United Kingdom Ports**

Based on Exchange rate as of Aug. 31

| | |
|---|---|
| Ferromanganese, export | $45.24 |
| Billets, open-hearth | 29.57 to $30.83 |
| Tin plate, per base box | 4.77 to 4.80 |
| Steel bars, open-hearth | 39.58 |
| Beams, open-hearth | 38.33 |
| Channels, open-hearth | 39.58 |
| Angles, open-hearth | 38.33 |
| Black sheets, No. 24 gage | 51.42 |
| Galvanized sheets, No. 24 gage | 61.45 |

## CONTINENTAL

**Per Metric Ton, f.o.b. Continental Ports**

Based on Exchange rate of Aug. 31

| | |
|---|---|
| Billets, Thomas | $19.27 |
| Wire rods, No. 5 B.W.G. | 36.90 |
| Steel bars, merchant | 26.64 |
| Sheet bars | 19.68 |
| Plate, ¼ in. and up | 35.42 |
| Plate, 3/16 in. and 5 mm. | 34.85 |
| Sheets, ⅛ in. | 36.90 |
| Beams, Thomas | 25.58 |
| Angles (Basic) | 25.58 |
| Hoops and strip base | 32.79 |
| Wire, plain, No. 8 | 44.03 |
| Wire nails | 47.15 |
| Wire, barbed, 4 pt. No. 10 B.W.G. | 71.74 |

# IRON AND STEEL WAREHOUSE PRICES

## PITTSBURGH

| | *Base per Lb.* |
|---|---|
| Plates | 3.25c. |
| Structural shapes | 3.25c. |
| Soft steel bars and small shapes | 3.05c. |
| Reinforcing steel bars | 3.05c. |
| Cold-finished and screw stock: | |
| Rounds and hexagons | 3.50c. |
| Squares and flats | 3.50c. |
| Hot rolled strip incl. 3/16 in. thick, under 24 in. wide | 3.30c. |
| Hoops | 3.80c. |
| Hot-rolled annealed sheets (No. 24), 25 or more bundles | 3.35c. |
| Galv. sheets (No. 24), 25 or more bundles | 4.05c. |
| Hot-rolled sheets (No. 10) | 3.05c. |
| Galv. corrug. sheets (No. 28), per square (more than 3750 lb.) | $3.77 |
| Spikes, large | 3.10c. |
| | *Per Cent Off List* |
| Track bolts, all sizes, per 100 count | 60 |
| Machine bolts, 100 count | 65-5 |
| Carriage bolts, 100 count | 65-5 |
| Nuts, all styles, 100 count | 65-5 |
| Large rivets, base per 100 lb. | $3.65 |
| Wire, black, soft ann'l'd, base per 100 lb. | 2.90c. |
| Wire, galv. soft, base per 100 lb. | 3.25c. |
| Common wire nails, per keg | 2.35c. |
| Cement coated nails, per keg. | 2.35c. |

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

## CHICAGO

| | *Base per Lb.* |
|---|---|
| Plates and structural shapes | 3.30c. |
| Soft steel bars, rounds | 3.10c. |
| Soft steel bars, squares and hexagons | 3.25c. |
| Cold-fin. steel bars: | |
| Rounds and hexagons | 3.65c. |
| Flats and squares | 3.65c. |
| Hot-rolled strip | 3.40c. |
| Hot-rolled annealed sheets (No. 24) | 3.95c. |
| Galv. sheets (No. 24) | 4.65c. |
| Spikes (keg lots) | 3.70c. |
| Track bolts (keg lots) | 4.70c. |
| Rivets, structural (keg lots) | 3.80c. |
| Rivets, boiler (keg lots) | 3.90c. |
| | *Per Cent Off List* |
| Machine bolts | *65 |
| Carriage bolts | *65 |
| Lag screws | *65 |
| Hot-pressed nuts, sq. tap or blank | *65 |
| Hot-pressed nuts, hex. tap or blank | *65 |
| Hex. head cap screws | 87½ |
| Cut point set screws | 75 and 10 |
| Flat head bright wood screws | 70 |
| Spring cotters | 55 |
| Stove bolts in full packages | 70 |
| Rd. hd. tank rivets, 7/16 in. and smaller | 57½ |
| Wrought washers | $4.50 off list |
| Black ann'l'd wire per 100 lb. | $3.95 |
| Com. wire nails, 50 kegs or more | 2.40c.† |
| Cement c't'd nails, 50 kegs or more | 2.40c.† |

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants wihtin the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

## NEW YORK

| | *Base per Lb.* |
|---|---|
| Plates, ¼ in. and heavier | 3.50c. |
| Structural shapes | 3.47c. |
| Soft steel bars, rounds | 3.41c. |
| Iron bars, Swed. charcoal | 6.75c. to 7.00c. |
| Cold-fin. shafting and screw stock: | |
| Rounds and hexagons | 3.96c. |
| Flats and squares | 3.96c. |
| Cold-rolled; strip, soft and quarter hard | 3.36c. |
| Hoops | 3.66c. |
| Bands | 3.66c. |
| Hot-rolled sheets (No. 10) | 3.15c. to 3.41c. |
| Hot-rolled ann'l'd sheets (No. 24*) | 3.75c. to 3.99c. |
| Galvanized sheets (No. 24*) | 4.10c. to 4.50c. |
| Long terne sheets (No. 24) | 5.25c. to 5.35c. |
| Armco iron, galv. (No. 24†) | 5.65c. |
| Toncan iron, galv. (No. 24†) | 5.65c. |
| Galvannealed (No. 24†) | 5.75c. |
| Armco iron, hot-rolled annealed (No. 24†) | 5.10c. |
| Toncan iron, hot-rolled annealed (No. 24†) | 5.10c. |
| Armco iron hot-rolled (No. 10†) | 4.15c. |
| Toncan iron, hot-rolled (No. 10†) | 4.15c. |
| Cold-rolled sheets (No. 20) less than 1000 lbs. | |
| Standard quality | 4.65c. |
| Deep drawing | 5.40c. |
| Stretcher leveled | 5.40c. |
| SAE, 2300, hot-rolled | 6.97c. |
| SAE, 3100, hot-rolled | 5.37c. |
| SAE, 6100, hot-rolled, annealed | 9.57c. |
| SAE, 2300, cold-rolled | 8.03c. |
| SAE, 3100, cold-rolled, annealed | 7.43c. |
| Floor plate ⅛ in. and heavier | 5.30c. |
| Standard tool steel | 11.25c. |
| Wire, black annealed (No. 9) | 3.50c. |
| Wire, galv. (No. 9) | 3.85c. |
| Tire steel, 1 x ½ in. and larger | 3.75c. |
| Open-hearth spring steel | 4.00c. to 10.00c. |
| Common wire nails, base per keg | $3.21 |
| | *Per Cent Off List* |
| Machine bolts, square head and nut: | |
| All diameters | 65 and 10 |
| Carriage bolts, cut thread: | |
| All diameters | 65 and 10 |

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

† 125 lb. and more.

## ST. LOUIS

| | *Base per Lb* |
|---|---|
| Plates and struc. shapes | 3.55c. |
| Bars, soft steel (rounds and flats) | 3.35c. |
| Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds) | 3.50c. |
| Cold-fin. rounds, shafting, screw stock | 3.90c. |
| Hot-rolled annealed sheets (No. 24) | 4.20c. |
| Galv. sheets (No. 24) | 4.90c. |
| Hot-rolled sheets (No. 10) | 3.40c. |
| Black corrug. sheets (No. 24) | 4.20c. |
| *Galv. corrug. sheets | 4.90c. |
| Structural rivets | 4.00c. |
| Boiler rivets | 4.10c. |
| | *Per Cent Off List* |
| Tank rivets, 7/16 in. and smaller | 55 |
| Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities | 70 |

*No. 26 and lighter take special prices.

## PHILADELPHIA

| | *Base per Lb.* |
|---|---|
| *Plates, ¼-in. and heavier | 3.10c. |
| *Structural shapes | 3.10c. |
| *Soft steel bars, small shapes, iron bars (except bands) | 3.15c. |
| ‡Reinforc. steel bars, sq. twisted and deformed | 2.96c. |
| Cold-finished steel bars | 3.91c. |
| *Steel hoops | 3.55c. |
| *Steel bands, No. 12 and 3/16 in. incl. | 3.30c. |
| Spring steel | 5.00c. |
| †Hot-rolled anneal. sheets (No. 24) | 3.75c. |
| †Galvanized sheets (No. 24) | 4.50c. |
| *Hot-rolled annealed sheets (No. 10) | 3.20c. |
| Diam. pat. floor plates, ¼ in. | 5.05c. |
| Swedish iron bars | 6.25c. |

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

## CLEVELAND

| | *Base per Lb.* |
|---|---|
| Plates and struc. shapes | 3.41c. |
| Soft steel bars | 3.00c. |
| ‡Reinforc. steel bars | 2.10c. |
| †Cold-finished steel bars | 3.65c. |
| Flat-rolled steel under ¼ in. | 3.46c. |
| Cold-finished strip | †3.00c. |
| Hot-rolled annealed sheets (No. 24) | 3.91c. |
| Galvanized sheets (No. 24) | 4.61c. |
| Hot-rolled sheets (No. 10) | 3.21c. |
| Hot-rolled 3/16 in. 24 to 48 in. wide sheets | 3.46c. |
| *Black ann'l'd wire, per 100 lb. | $2.85 |
| *No. 9 galv. wire, per 100 lb. | 3.20 |
| *Com. wire nails, base per keg | 2.30 |

†Outside delivery 10c. less.

*For 5000 lb. or less.

‡Plus switching and cartage charges and quantity differentials up to 50c.

## CINCINNATI

| | *Base per Lb.* |
|---|---|
| Plates and struc. shapes | 3.52c. |
| Bars, rounds, flats and angles | 3.32c. |
| Other shapes | 3.47c. |
| Rail steel reinforc. bars | 3.25c. |
| Hoops and bands, 3/16 in. and lighter | 3.57c. |
| Cold-finished bars | 3.87c. |
| Hot-rolled annealed sheets (No. 24) 25 bundles or more | 4.62c. |
| Galv. sheets (No. 24) 500 lb. or less | 4.47c. |
| Galvanized sheets (No. 24) over 3500 lb. | 4.07c. |
| Hot-rolled sheets (No. 10) | 3.32c. |
| Structural rivets | 4.50c. |
| Small rivets | 55 per cent off list |
| No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over) | $2.88 |
| Com. wire nails, base per keg: | |
| Any quantity less than carload. | 3.04 |
| Cement c't'd nails, base 100-lb keg | 3.50 |
| Chain, lin. per 100 lb | 8.35 |
| | *Net per 100 Ft.* |
| Seamless steel boiler tubes, 2-in. | $20.37 |
| 4-in. | 48.14 |
| Lap-welded steel boiler tubes, 2-in. | 19.38 |
| 4-in. | 45.32 |

## BUFFALO

| | *Base per Lb.* |
|---|---|
| Plates | 3.48c. |
| Struc. shapes | 3.35c. |
| Soft steel bars | 3.15c. |
| Reinforcing bars | 2.60c. |
| Cold-fin. flats and sq. | 3.70c. |
| Rounds and hex. | 3.70c. |
| Cold-rolled strip steel | 3.19c. |
| Hot-rolled annealed sheets (No. 24) | 4.16c. |
| Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide) | 3.53c. |
| Galv. sheet (No. 24) | 4.80c. |
| Bands | 3.53c. |
| Hoops | 3.53c. |
| Heavy top-rolled sheets | 3.28c. |
| Com. wire nails, base per keg. | $2.85 |
| Black wire, base per 100 lb. (2500-lb. lots or under) | 4.00 |
| (Over 2500 lb.) | 3.90 |

## BOSTON

| | *Base per Lb.* |
|---|---|
| Beams, channels, angles, tees, zees | 3.64c. |
| H beams and shapes | 3.64c. |
| Plates — Sheared, tank, and univ. mill, ¼ in. thick and heavier | 3.66c. |
| Floor plates, diamond pattern | 5.46c. |
| Bar and bar shapes (mild steel) | 3.55c. |
| Bands 3/16 in. thick and No. 12 ga. incl. | 3.75c. to 4.75c. |
| Half rounds, half ovals, ovals and bevels | 4.80c. |
| Tire steel | 4.80c. |
| Cold-rolled strip steel | 3.245c. |
| Cold-finished rounds, squares and hexagons | 4.05c. |
| Cold-finished flats | 4.05c. |
| Blue annealed sheets, No. 10 ga. | 3.75c. |
| One pass cold-rolled sheets No. 24 ga. | 4.30c. |
| Galvanized steel sheets, No. 24 ga. | 4.30c. |
| Lead coated sheets, No. 24 ga. | 5.85c. |

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

## DETROIT

| | *Base per Lb.* |
|---|---|
| Soft steel bars | 3.19c. |
| Structural shapes | 3.52c. |
| Plates | 3.52c. |
| Floor plates | 5.27c. |
| Hot-rolled annealed sheets (No. 24)* | 4.04c. |
| Hot-rolled sheets (No. 10)** | 3.24c. |
| Galvanized sheets (No. 24) | 4.82c. |
| Bands | 3.49c. |
| Hoops | 3.49c. |
| †Cold-finished bars | 3.74c. |
| Cold-rolled strip | 3.18c. |
| Hot-rolled alloy steel (S.A.E. 3100 Series) | 5.44c. |
| Bolts and nuts, in cases, | 70 and 10 per cent off list |
| Broken cases | 70 per cent off |

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

* Base less 0.25c., 3500 lb. and over. Add 0.50c. per hundred lb. for broken bundles.

** Base less 0.25c., 1500 to 3749 lbs.; less 0.50c., 3750 to 7499 lb.; less 0.75c., 7500 lb. and over.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

Country territory to be equalized on the Chicago plan.

## MILWAUKEE

| | *Base per Lb.* |
|---|---|
| Plates and structural shapes | 3.41c. |
| Soft steel bars, rounds up to 8 in., flats and fillet angles | 3.21c. |
| Soft steel bars, squares and hexagons | 3.36c. |
| Hot-rolled strip | 3.51c. |
| Hot-rolled sheets (No. 10) | 3.26c. |
| Hot-rolled annealed sheets (No. 24) | 4.06c. |
| Galvanized sheets (No. 20) | 4.76c. |
| Cold-finished steel bars | 3.76c. |
| Cold-rolled strip | 3.33c. |
| Structural rivets (keg lots) | 4.01c. |
| Boiler rivets, cone head (keg lots) | 4.11c. |
| Track spikes (keg lots) | 3.91c. |
| Track bolts (keg lots) | 4.91c. |
| Black annealed wire | 3.40c. |
| Com. wire nails | 2.60c. |
| Cement coated nails | 2.60c. |

| | *Per Cent Off List* |
|---|---|
| Machine bolts, carriage bolts and lag screws | 70 to 75 |
| Hot-pressed nuts, sq. and hex. tapped or blank (keg lots) | 70 |

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

## ST. PAUL

| | *Base per Lb.* |
|---|---|
| Mild steel bars, rounds | 3.35c. |
| Structural shapes | 3.55c. |
| Plates | 3.55c. |
| Cold-finished bars | 3.90c. |
| Bands and hoops | 3.65c. |
| Hot-rolled annealed sheets, No. 24 | 4.20c. |
| Galvanized sheets, No. 24 | 4.90c. |

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

## BALTIMORE

| | *Base per Lb.* |
|---|---|
| Mild Steel bars and small shapes | 3.10c. |
| Structural shapes | 3.10c. |
| Reinforcing bars | ....prices on application |
| Plates | 3.10c. |
| Hot-rolled sheets, No. 10 | 3.20c. |
| Bands | 3.30c. |
| Hoops | 3.55c. |
| Special threading steel | 3.20c. |
| Diamond pattern floor plates ¼ in. and heavier | 5.10c. |
| Galvanized bars and small shapes | 5.60c. |
| Galvanized bands | 5.80c. |
| Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more | 3.88c. |

All prices are for 2000 lb. and more.

For second zone add 10c. per 100 lb. for trucking.

List size extras of Aug. 15, 1935, and cutting extras to be added.

For cold-rolled products, list size extras from Jan. 1, 1936, and cutting extras to be added.

## CHATTANOOGA

| | *Base per Lb.* |
|---|---|
| Mild steel bars | 3.46c. |
| Iron bars | 3.46c. |
| Reinforcing bars | 3.46c. |
| Structural shapes | 3.66c. |
| Plates | 3.66c. |
| Hot-rolled sheets No. 10 | 3.46c. |
| Hot-rolled annealed sheets No. 24* | 3.41c. |
| Galvanized sheets, No. 24* | 3.96c. |
| Steel bands | 3.71c. |
| Cold-finished bars | 4.281c. |

* Plus mill item extra.

## MEMPHIS

| | *Base per Lb.* |
|---|---|
| Mild steel bars | 3.57c. |
| Shapes, bar size | 3.57c. |
| Iron bars | 3.57c. |
| Structural shapes | 3.77c. |
| Plates | 3.77c. |
| Hot-rolled sheets, No. 10 | 3.57c. |
| Hot-rolled annealed sheets, No. 24 | 4.37c. |
| Galvanized sheets, No. 24 | 5.07c. |
| Steel bands | 3.82c. |
| Cold-drawn rounds | 4.04c. |
| Cold-drawn flats, squares, hexagons | 6.04c. |
| Structural rivets | 4.25c. |
| Bolts and nuts, per cent off list | 65 |
| Small rivets, per cent off list. | 50 |

## NEW ORLEANS

| | *Base per Lb* |
|---|---|
| Mild steel bars | 3.45c. |
| Reinforcing bars | 3.50c. |
| Structural shapes | 3.65c. |
| Plates | 3.65c. |
| Hot-rolled sheets, No. 10 | 3.65c. |
| Hot-rolled annealed sheets, No. 24 | 4.35c. |
| Galvanized sheets, No. 24 | 4.95c. |
| Steel bands | 4.05c. |
| Cold-finished steel bars | 4.55c. |
| Structural rivets | 4.25c. |
| Boiler rivets | 4.25c. |
| Common wire nails, base per keg | $2.65 |
| Bolts and nuts, per cent off list | 70 |

## PACIFIC COAST

| | Base per Lb. San Francisco | Los Angeles | Seattle |
|---|---|---|---|
| Plates, tank and U. M. | 3.50c. | 3.60c. | 3.55c. |
| Shapes, standard | 3.50c. | 3.60c. | 3.55c. |
| Soft steel bars | 3.50c. | 3.60c. | 3.70c. |
| Reinforcing bars, f.o.b. cars dock Pacific ports | 2.45c. | 2.45c. | 2.45c. |
| Hot-rolled annealed sheets (No. 24) | 4.20c. | 4.15c. | 4.40c. |
| Hot-rolled sheets (No. 10) | 3.60c. | 3.70c. | 3.75c. |
| Galv. sheets (No. 24 and lighter) | 5.00c. | 4.40c. | 5.00c. |
| Galv. sheets (No. 22 and heavier) | 5.00c. | 4.60c. | 5.00c. |
| Cold finished steel Rounds | 5.95c. | 6.00c. | 6.00c. |
| Squares and hexagons | 7.20c. | 7.25c. | 7.25c. |
| Flats | 7.30c. | 7.75c. | 8.25c. |
| Common wire nails—base per keg less carload | $2.90 | $2.90 | $2.90 |

All items subject to differentials for quantity.

# REFRACTORIES PRICES

### Fire Clay Brick

| | *Per 1000 f.o.b Works* |
|---|---|
| High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois | $45.00 |
| High-heat duty, New Jersey | 50.00 |
| High-heat duty, Ohio | 40.00 |
| Intermediate, Pennsylvania, Maryland, Kentucky, Missouri and Illinois | 40.00 |
| Intermediate, New Jersey | 43.00 |
| Intermediate, Ohio | 35.00 |
| Ground fire clay, per ton | 7.00 |

### Silica Brick

| | *Per 1000 f.o.b Works* |
|---|---|
| Pennsylvania | $45.00 |
| Chicago District | 54.00 |
| Birmingham | $48 to 50.00 |
| Silica cement per net ton | 8.00 |

### Chrome Brick

| | *Per Net Ton* |
|---|---|
| Standard f.o.b. Baltimore, Plymouth Meeting and Chester | $45.00 |
| Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. | 45.00 |

### Magnesite Brick

| | *Per Net Ton* |
|---|---|
| Standard f.o.b. Baltimore and Chester, Pa. | $65.00 |
| Chemically bonded, f.o.b. Baltimore | 55.00 |

### Grain Magnesite

| | *Per Net Ton* |
|---|---|
| Imported, f.o.b. Baltimore and Chester, Pa. (in sacks) | $45.00 |
| Domestic, f.o.b. Baltimore and Chester, in sacks | 40.00 |
| Domestic, f.o.b. Chewelah, Wash. | 22.00 |

# RAW MATERIALS PRICES

## PIG IRON

**No. 2 Foundry**

| | |
|---|---|
| F.o.b. Everett, Mass.; Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md. | $20.50 |
| Delivered Brooklyn | 22.9289 |
| Delivered Newark or Jersey City | 21.9873 |
| Delivered Philadelphia | 21.3132 |
| F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill. | 19.50 |
| F.o.b. Jackson, Ohio | 21.25 |
| Delivered Cincinnati | 19.82 |
| F.o.b. Duluth | 20.00 |
| F.o.b. Provo, Utah | 17.50 |
| Delivered San Francisco, Los Angeles or Seattle | 22.315 |
| F.o.b. Birmingham* | 15.88 |

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of .70 and over.

**Malleable**

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

**Basic**

| | |
|---|---|
| F.o.b. Everett, Mass.; Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md. | $20.00 |
| Delivered Boston Switching District | 20.50 |
| Delivered Newark or Jersey City | 21.4873 |
| Delivered Philadelphia | 20.8132 |
| F.o.b. Buffalo | 18.50 |
| F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill. | 19.00 |
| Delivered Cincinnati | 18.82 |
| Delivered Canton, Ohio | 20.3482 |
| Delivered Mansfield, Ohio | 20.8832 |
| F.o.b. Jackson, Ohio | 20.75 |
| F.o.b. Provo, Utah | 17.00 |
| F.o.b. Birmingham | 14.50 |

**Bessemer**

| | |
|---|---|
| F.o.b. Everett, Mass.; Bethlehem, Birdsboro and Swedeland, Pa. | $21.50 |
| Delivered Boston Switching District | 22.00 |
| Delivered Newark or Jersey City | 22.9873 |
| Delivered Philadelphia | 22.3132 |
| F.o.b. Buffalo and Erie, Pa., and Duluth | 20.50 |
| F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Birmingham | 20.00 |
| Delivered Cincinnati | 21.0807 |
| Delivered Canton, Ohio | 21.3482 |
| Delivered Mansfield, Ohio | 21.8832 |

**Low Phosphorus**

| | |
|---|---|
| Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. | $24.00 |

**Gray Forge**

| | |
|---|---|
| Valley or Pittsburgh furnace | $19.00 |

**Charcoal**

| | |
|---|---|
| Lake Superior furnace | $22.00 |
| Delivered Chicago | 25.2528 |

**Canadian Pig Iron**

*Per Gross Ton*

Delivered Toronto.

| | |
|---|---|
| No. 1 fdy., sil. 2.25 to 2.75 | $21.00 |
| No. 2 fdy., sil. 1.75 to 2.75 | 20.50 |
| Malleable | 22.50 |

Delivered Montreal

| | |
|---|---|
| No. 1 fdy., sil. 2.25 to 2.75 | $22.50 |
| No. 2 fdy., sil. 1.75 to 2.25 | 22.00 |
| Malleable | 22.50 |
| Basic | 22.00 |

## FERROALLOYS

**Ferromanganese**

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

*Per Gross Ton*

| | |
|---|---|
| Domestic, 80% (carload) | $75.00 |

**Spiegeleisen**

*Per Gross Ton Furnace*

| | |
|---|---|
| Domestic, 19 to 21% | $26.00 |
| 50-ton lots 3-mo. shipment | 24.00 |
| F.o.b. New Orleans | 26.00 |

**Electric Ferrosilicon**

*Per Gross Ton Delivered*

| | |
|---|---|
| 50% (carloads) | $69.50 |
| 50% (ton lots) | 77.00 |
| 75% (carloads) | 126.00 |
| 75% (ton lots) | 130.00 |

**Silvery Iron**

*Per Gross Ton*

| | |
|---|---|
| F.o.b. Jackson, Ohio, 6.00 to 6.50% | $22.75 |

For each additional 0.5% silicon up to 12%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

**Bessemer Ferrosilicon**

*F.o.b. Jackson, Ohio, Furnace*

*Per Gross Ton*

| | |
|---|---|
| 10.00 to 10.50% | $27.75 |
| 10.51 to 11.00% | 28.25 |
| 11.00 to 11.50% | 28.75 |
| 11.51 to 12.00% | 29.25 |
| 12.01 to 12.50% | 29.75 |
| 12.51 to 13.00% | 30.25 |
| 13.01 to 13.50% | 30.75 |
| 13.51 to 14.00% | 31.25 |
| 14.01 to 14.50% | 31.75 |
| 14.51 to 15.00% | 32.25 |
| 15.01 to 15.50% | 32.75 |
| 15.51 to 16.00% | 33.25 |
| 16.01 to 16.50% | 33.75 |
| 16.51 to 17.00% | 34.25 |

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

**Other Ferroalloys**

| | |
|---|---|
| Ferrotungsten, per lb. contained W del., carloads | $1.30 |
| Ferrotungsten, lots of 5000 lb. | 1.35 |
| Ferrotungsten, smaller lots | 1.40 |
| Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract | 10.00c. |
| Ferrochromium, 2% carbon | 16.50c. to 17.00c. |
| Ferrochromium, 1% carbon | 17.50c. to 18.00c. |
| Ferrochromium, 0.10% carbon | 19.50c. to 20.00c. |
| Ferrochromium, 0.06% carbon | 20.00c. to 20.50c. |
| Ferrovanadium, del. per lb. contained V. | $2.70 to $2.90 |
| Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y. | $2.50 |
| Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton | $137.50 |
| Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton | 142.50 |
| Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton | 58.50 |
| Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn. | 75.00 |
| Ferromolybdenum, per lb. Mo del. | 95c. |
| Calcium molybdate, per lb. Mo del. | 80c. |
| Silico spiegel, per ton, f.o.b. furnace, carloads | $38.00 |
| Ton lots or less, per ton | 45.50 |
| Silico-manganese, gross ton, delivered. | |
| 2.50% carbon grade | 85.00 |
| 2% carbon grade | 90.00 |
| 1% carbon grade | 100.00 |

Note: Spot prices are $5 a ton higher except on 75 per cent ferrosilicon on which premium is $10 a ton.

## ORES

**Lake Superior Ores**

*Delivered Lower Lake Ports*

*Per Gross Ton*

| | |
|---|---|
| Old range, Bessemer, 51.50%... | $4.80 |
| Old range, non-Bessemer, 51.50% | 4.65 |
| Mesabi, Bessemer, 51.50% | 4.65 |
| Mesabi, non-Bessemer, 51.50% | 4.50 |
| High phosphorus, 51.50% | 4.40 |

**Foreign Ore**

*C.i.f. Philadelphia or Baltimore*

*Per Unit*

| | |
|---|---|
| Iron, low phos., copper free, 55 to 58% dry Spain or Algeria | 10.25c. |
| Iron, low phos., Swedish, average, 63½% iron | 10.25c. |
| Iron, basic or foundry, Swedish, aver. 65% iron | 9.50c. |
| Iron, basic or foundry, Russian, aver. 65% iron | Nominal |
| Man., Caucasian, washed 52% | 26c. |
| Man., African, Indian, 44-48% | 25c. |
| Man., African, Indian, 49-51% | 26c. |
| Man., Brazilian, 46 to 48½% | 24c. |

*Per Net Ton Unit*

| | |
|---|---|
| Tungsten, Chinese, wolframite, duty paid, delivered, nominal | 16.00 |
| Tungsten, domestic, scheelite delivered, nominal | 16.00 |

*Per Gross Ton*

| | |
|---|---|
| Chrome, 45% $Cr_2O_3$, lump, c.i.f. Atlantic Seaboard (African) | $17.50 |
| 45 to 46% $Cr_2O_3$ (Turkish) | $16.50 to 17.00 |
| 48% $Cr_2O_3$ (African) | 20.50 |
| 48% min. $Cr_2O_3$ (Turkish) | 19.25 |
| Chrome concentrate, 50% and over $Cr_2O_3$, c.i.f. Atlantic ports | 22.00 |
| 52% $Cr_2O_3$ (Turkish) | 21.75 |
| 48 to 49% $Cr_2O_3$ (Turkish) | 19.25 |

## FLUORSPAR

*Per Net Ton*

| | |
|---|---|
| Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail | $18.00 |
| Domestic, barge and rail | 18.50 |
| No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines | 20.00 |
| Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid | 21.50 |
| Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines | 35.00 |

## FUEL OIL

*Per Gal.*

| | |
|---|---|
| F.o.b. Bayonne or Baltimore, No. 3 distillate | 4.25c. |
| F.o.b. Bayonne or Baltimore, No. 4 industrial | 3.75c. |
| Del'd Ch'go, No. 3 industrial | 5.00c. |
| Del'd Ch'go, No. 5 industrial | 3.77c. |
| Del'd Cleve'd, No. 3 distillate | 5.87½c. |
| Del'd Cleve'd, No. 4 industrial | 5.75c. |
| Del'd Cleve'd, No. 5 industrial | 5.00c. |

## COKE AND COAL

**Coke**

*Per Net Ton*

| | |
|---|---|
| Furnace, f.o.b. Connellsville, Prompt | $3.65 to $3.75 |
| Foundry, f.o.b. Connellsville Prompt | 4.00 to 5.75 |
| Foundry, by-product, Chicago ovens | 9.00 |
| Foundry, by-product, del'd New England | 11.50 |
| Foundry, by-product, del'd Newark or Jersey City | 9.65 |
| Foundry, by-product, Philadelphia | 9.38 |
| Foundry, by-product, delivered Cleveland | 9.75 |
| Foundry, by-product, delivered Cincinnati | 9.50 |
| Foundry, Birmingham | 6.50 |
| Foundry, by-product, St. Louis, f.o.b. ovens | 8.00 |
| Foundry, from Birmingham, f.o.b. cars docks, Pacific ports | 14.75 |

**Coal**

*Per Net Ton*

| | |
|---|---|
| Mine run steam coal, f.o.b. W. Pa. mines | $1.50 to $1.75 |
| Mine run coking coal, f.o.b. W. Pa. | 1.75 to 1.90 |
| Gas coal, ¾-in. f.o.b. Pa. mines | 2.00 to 2.25 |
| Mine run gas coal, f.o.b. Pa. mines | 1.80 to 2.00 |
| Steam slack, f.o.b. W. Pa. mines | 1.00 to 1.25 |
| Gas slack, f.o.b. W. Pa. mines | 1.20 to 1.45 |

# NIAGARA
BRAND
# FERRO – ALLOYS

*For High Quality Steels*

**FERRO SILICON**
ALL GRADES

**FERRO CHROMIUM**
HIGH CARBON

**FERRO CHROMIUM**
LOW CARBON

**FERRO MANGANESE**

**SILICO MANGANESE**

# PITTSBURGH METALLURGICAL CO., Inc.

**NIAGARA FALLS, N. Y.**

Sales Offices: NEW YORK—30 Church St. • PITTSBURGH—Oliver Bldg. • CLEVELAND—Hanna Bldg.

# FABRICATED STEEL

***. . . Lettings light at 11,265 tons compared with 20,045 tons last week.***

o o o

***. . . New projects rise to 7525 tons against 6590 tons in the previous week.***

o o o

***. . . Plate awards call for only 210 tons.***

### NORTH ATLANTIC STATES

**Lewiston, Me.,** 426 tons, State bridge, to Phoenix Bridge Co., Phoenixville, Pa.

**Clinton, Me.,** 150 tons, State bridge, to American Bridge Co.

**Milbridge, Me.,** 100 tons, State bridge, to Lackawanna Steel Construction Co.

**Ogdensburg, N. Y.,** 335 tons, junior high school, to Syracuse Engineering Co., Syracuse, N. Y.

**Jamestown, N. Y.,** 110 tons, addition to Jamestown Metal Equipment factory, to Rogers Structural Steel, Corry, Pa.

**Rahway, N. J.,** 210 tons, National Pneumatic Co. building, to Lehigh Structural Steel Co., Allentown, Pa.

**Indiana, Pa.,** 140 tons, highway bridge, to American Bridge Co.

### SOUTH AND SOUTHWEST

**Springfield, W. Va.,** 310 tons, highway bridge, to Fort Pitt Bridge Works Co.

**Pendleton County, Ky.,** 560 tons, bridge, to Vincennes Bridge Co., Vincennes, Ind.

**Clarke County, Miss.,** 145 tons, bridge, to Virginia Bridge Co., Roanoke, Va.

**Monroe-Lee Counties, Miss.,** 255 tons, bridge, to Vincennes Bridge Co.

**Bexar County, Tex.,** 570 tons, bridge, to Virginia Bridge Co.

**Carson County, Tex.,** 180 tons, bridge, to Capitol Steel & Iron Co., Oklahoma City.

**Latimer-LeFlore Counties, Okla.,** 250 tons, bridge, to Capitol Steel & Iron Co.

### CENTRAL STATES

**Lowellville, Ohio,** 270 tons, addition to building for Sharon Steel Co., to Pittsburgh Bridge & Iron Works Co., Rochester, Pa.

**Norwich, Ohio,** 135 tons, bridge, to Burger Iron Co., Akron, Ohio.

**Cleveland,** 117 tons, Westerly sewage disposal plant, to Bethlehem Steel Co.

**Cincinnati,** 900 tons, transmission towers for Cincinnati Gas & Electric Co., to Blaw-Knox Co.

**Columbus, Ohio,** 640 tons, bridge for Pennsylvania Railroad, to Bethlehem Steel Corp.

**Chicago,** 340 tons, Goodman Mfg. Co. factory building, to R. C. Mahon & Co.

**Evanston, Ill.,** 135 tons, Paul Regan service station, to Wendnagle & Co., Chicago.

**Springfield, Ill.,** 1600 tons, factory building for Allis-Chalmers Mfg. Co., to Worden-Allen Co., Milwaukee.

**Sangamon County, Ill.,** 530 tons, bridge, to Mississippi Valley Structural Steel Co., Decatur, Ill.

**Wykoff, Minn.,** 120 tons, highway bridge, to American Bridge Co.

**West Allis, Wis.,** 150 tons, laboratory for Allis-Chalmers Mfg. Co., to American Bridge Co.

**Manhattan, Kan.,** 1600 tons, bridge, to Kansas City Structural Steel Co.

**Havelock, Neb.,** 120 tons, viaduct, to Lincoln Steel Works, Lincoln, Neb.

### WESTERN STATES

**Pleasanton, Cal.,** 140 tons, bridge for Western Pacific Railroad, to American Bridge Co.

**St. Regis, Cal.,** 200 tons, St. Regis Kraft Co. plant, to Isaacson Iron Works.

**Pierce County, Wash.,** 522 tons, Nisqualia bridge construction, to Pacific Car & Foundry Co.

## NEW STRUCTURAL STEEL PROJECTS

### NORTH ATLANTIC STATES

**Providence,** 200 tons, New Haven Railroad bridge.

**Cambridge, Mass.,** 150 tons, Radcliffe College unit.

**Mansfield, Mass.,** 225 tons, highway bridge.

**New Hartford, Conn.,** 170 tons, highway bridge.

**Elmira, N. Y.,** 200 tons, alterations and addition to New York State Reformatory.

**Albany, N. Y.,** 200 tons, warehouse for National Casket Co.

**Lancaster County, Pa.,** 180 tons, highway bridge.

**Tioga County, Pa.,** 200 tons, highway bridge.

**Teaneck, N. J.,** 1400 tons, armory; bids Sept. 21.

**Camden, N. J.,** 175 tons, armory; bids Sept. 14.

### THE SOUTH

**Houston, Tex.,** 400 tons, refinery unit for Shell Petroleum Co.; Foster-Wheeler Co., New York, general contractor.

**State of Mississippi,** 1100 tons, bridges.

### CENTRAL STATES

**Niles, Ohio,** 900 tons, addition to tin strip mill, for Republic Steel Corp.; 90 tons for machine shop extension at Warren, Ohio, is also included in tonnage.

**Cleveland,** 210 tons, two Granger Road bridges for State Highway Department.

**Suring, Wis.,** 140 tons, State bridge; bids close Sept. 4.

**St. Louis Park, Minn.,** 1000 tons, underpass.

**Rapid City, S. D.,** 110 tons, bridge.

### WESTERN STATES

**Walsenburg, Colo.,** 140 tons, bridge for Denver & Rio Grande Railroad.

**Helper, Utah,** 130 tons, highway bridge.

**Clark County, Nev.,** 300 tons, highway bridge.

**Los Angeles,** 119 tons, department of water and power for East Portal aggregate plant; bids taken Sept. 1.

**Los Angeles,** 20,000 tons, post office and courthouse; bids advanced to Sept. 29.

## FABRICATED PLATES

### AWARDS

**St. Louis,** 210 tons, two barges, to St Louis Shipbuilding Co.

### NEW PROJECTS

**Cleveland,** 750 tons, rebuilding blast furnace for Republic Steel Corp.

**Los Angeles,** 970 tons, Hayfield pumping plant for Metropolitan Water District; L. E. Dixon and Case Construction Co., low bidders on general contract.

## SHEET PILING

### AWARDS

**Cleveland,** 275 tons, Westerly sewage disposal plant, to Bethlehem Steel Co.

**Marcus Hook, Pa.,** 420 tons for Sinclair Refining Co. wharf, to Belmont Iron Works.

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## Iron Steel Exports Gain in July

WASHINGTON, Sept. 1.—Making a gain of 1788 gross tons, exports of iron and steel in July totaled 296,738 tons compared with 294,951 tons in June. For the seven months ended July, exports rose 38,860 tons to 1,928,329 tons from 1,889,469 tons in the corresponding period of last year.

Of the total exports in July, 192,817 tons consisted of scrap, while scrap exports during the first seven months of the current year were 1,243,090 tons.

The largest tonnages of finished steel exported in July consisted of black steel sheets, 16,088 tons, and tin plate, 16,010 tons.

# THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

***. . . Backlog continues as a machine tool problem.***

o o o

***. . . Orders for forging machinery and boring mills are more active.***

o o o

***. . . Used equipment is receiving foreign attention on favorable deliveries.***

By L. M. WAITE

THE final week of August was possibly the quietest of a very satisfactory month as to volume of machine tool orders. There have been some rumors of early program buying; the appearance of locomotive orders is accepted as a forerunner of more railroad activity; and considerable publicity has been given to automotive plans. Inquiries are plentiful. Orders from well scattered and diversified industries maintain an order book condition of heavy backlogs; booked orders in some cases are said to be sufficient to sustain peak operation over the remainder of the year even if the shortage of skilled mechanics should be overcome.

Associated Machine Tool Dealers will hold their annual meeting at Granville, Ohio, Sept. 21-22.

## *Cleveland*

MACHINE tool business continues good, although dealers report that there are present some signs of a tapering in the volume. Sales by dealers during August were better than in July. Orders are coming from widely diversified industries, although the motor car industry leads in the demand. Turret lathe orders, while good, were not as heavy in August as in July. Forging machinery has become quite active, considerable business in lots up to half a dozen machines coming from automobile forge shops that are replacing equipment that is less efficient than the later types of forging machines. About 90 per cent of the forging machine orders are coming from the automotive field.

## *Pittsburgh*

INQUIRIES are better this week. There is a good diversification and a trend toward a greater interest in larger and higher priced machines. Despite vacations, total volume of business in August will be equally as good as that experienced in June and July. Dealers are optimistic about prospects over the next few months. Activity is not confined to any particular machine line, there being a general miscellaneous demand. Deliveries are not getting any better, standard machines running from four to 12 weeks. On a few particular items delivery cannot be had under seven months.

## *Cincinnati*

THE continued building of backlogs is causing some anxiety among local machine tool builders. Except in heavy tools, where demand is still sluggish, delivery dates are being gradually pushed forward in some instances to five months on tools heretofore to be had in 90 days. Some tool builders report backlogs of from two to three months.

Demand the past week was slightly better than in the preceding period, with reports of additional boring mill sales. Grinder demand, while unabated, shows a tendency to shift in types and sizes. Foreign business continues active. Plants adhere to a high level of operations.

## *Chicago*

AUGUST bookings are on a par with those of July, and local dealers, sizing up the briskness of both new and old inquiries, are looking for a new sales high in the near future. Several inquiries are in from Chicago steel mills, largely for heavy grinding equipment. The small tool market, which was dragging a week to 10 days ago, has again picked up. Die heads have been particularly active.

## *New York*

DEALERS generally are well pleased with August orders and inquiries. In some instances previous banner months were equaled or approximated in volume of business placed. Optimism prevails as to the remainder of the year. Several direct representatives anticipate some program buying during the early part of September.

## *Foreign*

FOREIGN necessity for machine shop equipment has afforded opportunity for disposal of a considerable number of used machine tools which, because of the domestic determination to modernize, might have otherwise remained unsold for some little time. Quite a number of these are to be rebuilt by purchasers for specific production jobs planned by foreign governments. The search for good used machines for prompt shipments continues quite energetically.

## Table I—Survey of iron and steel materials "imported" to

Net Tons
(1929 Rail Figures Incomplete)

| | | | | UNMANUFACTURED | | | | SEMI-MANUFACTURED | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Via | Direction | | Iron Ore | Pig Iron & 6th Class | Scrap | Ferro Alloys | Blooms, Billets, Ingots | Castings, Forgings Car-wheels | Cast Iron Pipe & Fittings | Un-classified | Tin Plate & Terne | Plates, Sheets & Shapes | Bars, Band & Hoop Iron, Rods Angles | Un-classified |
| 1934 | Rail | Received .. | (Northwestern States) | 100 | 1,621 | 7,529 | .... | .... | 293 | 1,168 | .... | 69,006 | 246 | 109 | 13,735 |
| | | Shipped | | 2,157 | 1,270 | 267 | .... | .... | 53 | 11 | .... | 2,827 | .... | .... | 11,649 |
| | Water | R. | | .... | 1,255 | 75 | 162 | .... | 4,142 | 3,093 | 6,842 | 60 | 15,095 | 4,907 | 16,044 |
| | | S. | | .... | .... | 78,072 | .... | .... | 816 | 117 | 4,436 | 2,199 | 2,652 | 656 | 3,930 |
| 1933 | Rail | R. | | 140 | 1,076 | 1,382 | .... | 129 | 283 | 1,329 | .... | 76,558 | 225 | 166 | 13,653 |
| | | S. | | 1,825 | 600 | 327 | .... | .... | .... | 1 | .... | 276 | .... | .... | 4,739 |
| | Water | R. | | .... | 1,010 | .... | 371 | .... | 2,665 | 1,300 | 17 | 5,591 | 14,545 | 4,212 | 10,905 |
| | | S. | | .... | 282 | 48,964 | .... | .... | 659 | .... | 3,029 | 3,211 | 1,422 | .... | 1,716 |
| 1929 | Rail | R. | | .... | 424 | 14,016 | .... | .... | 270 | 1,782 | .... | 16,563 | 1,120 | .... | 3,878 |
| | | S. | | .... | .... | 1,957 | .... | .... | .... | .... | .... | 43 | .... | .... | 814 |
| | Water | R. | | .... | 5,164 | .... | .... | 672 | .... | .... | 10,175 | 53,462 | 8,376 | .... | 29,848 |
| | | S. | | .... | .... | 25,518 | .... | .... | 12,616 | .... | 1,278 | 26,455 | .... | .... | 1,496 |
| 1934 | Rail | Received .. | (California) | 334 | 64,843 | 12,279 | .... | .... | 713 | 7,165 | .... | 111,193 | 2,463 | 1,830 | 12,584 |
| | | Shipped | | .... | 111 | 169 | .... | .... | 376 | 783 | .... | 1,660 | 1,351 | 1,227 | 2,956 |
| | Water | R. | | 614 | 12,109 | .... | 2,263 | 15,975 | .... | .... | 17,544 | 46,449 | 54,001 | 15,633 | 91,464 |
| | | S. | | 102 | .... | 189,251 | 336 | 531 | .... | .... | 1,692 | 6,219 | 12,821 | 1,417 | 6,341 |
| 1933 | Rail | R. | | .... | 56,754 | 2,298 | .... | .... | 481 | 1,554 | .... | 123,117 | 2,524 | 1,865 | 6,617 |
| | | S. | | 1 | .... | 2,898 | .... | .... | 52 | 55 | .... | 73 | 149 | 75 | 1,240 |
| | Water | R. | | .... | 12,573 | .... | 1,718 | 10,074 | .... | .... | 28,449 | 8,703 | 27,046 | 51,878 | 69,739 |
| | | S. | | .... | .... | 69,145 | 202 | 271 | .... | .... | 4,497 | 5,576 | 2,126 | 6,428 | 60,486 |
| 1929 | Rail | R. | | 296 | 63,096 | 6,233 | .... | .... | .... | 4,030 | .... | 81,069 | .... | .... | 12,337 |
| | | S. | | 472 | 22 | 28,144 | .... | .... | .... | 44 | .... | .... | .... | .... | 356 |
| | Water | R. | | 174 | 21,377 | .... | 403 | 3,486 | .... | .... | 176,453 | 113,598 | .... | 183,248 | 984,810 |
| | | S. | | 71 | .... | 9,883 | .... | 30 | .... | .... | 31,076 | 7,591 | .... | 24,209 | 38,876 |

## Table Ia—Summary of rail and water receipts and

| | Original Data—Annual Values | | | | | |
|---|---|---|---|---|---|---|
| | 1934 (90%) | | 1933 (90%) | | 1929 (70%) | |
| Item | Received | Shipped | Received | Shipped | Received | Shipped |
| Unmanufactured: | | | | | | |
| Iron ore | 1,048 | 2,259 | 140 | 1,826 | 470 | 543 |
| Pig iron* | 84,070 | 1,640 | 70,640 | 960 | 112,370 | 600 |
| Scrap | 19,883 | 267,759 | 3,680 | 121,334 | 20,249 | 65,502 |
| Ferro-alloys | 2,425 | 336 | 2,089 | 202 | 403 | ..... |
| Ingots, etc. | 15,975 | 531 | 10,203 | 271 | 4,158 | 30 |
| Castings, forgings | 5,148 | 1,245 | 3,429 | 711 | 270 | 12,616 |
| Cast iron pipe | 11,426 | 911 | 4,183 | 56 | 5,812 | 44 |
| Unclassified | 24,386 | 6,128 | 23,466 | 7,526 | 186,628 | 32,354 |
| Semi-Manufactures: | | | | | | |
| Tin plate, terne* | 241,400 | 4,300 | 216,500 | 1,550 | 255,600 | 5,200 |
| Plates, sheets | 71,805 | 16,824 | 44,340 | 3,697 | 9,496 | ..... |
| Bars, rods | 22,479 | 3,300 | 58,117 | 6,403 | 183,248 | 24,209 |
| Unclassified | 133,827 | 24,876 | 100,914 | 68,181 | 1,030,873 | 41,542 |
| Simple Manufactures: | | | | | | |
| Rails | 10,828 | 1,200 | 2,056 | 699 | 27,087 | 8,705 |
| Railroad material | 3,123 | 1,286 | 1,571 | 2,036 | 3,867 | 2,047 |
| Wire & Mfrs. | 53,863 | 10,800 | 26,546 | 7,193 | 88,014 | 11,488 |
| I. & S. pipe | 227,390 | 14,558 | 95,640 | 5,341 | 235,101 | 16,763 |
| Nails, etc. | 8,694 | 4,733 | 8,022 | 4,178 | 44,083 | 1,023 |
| Structural | 107,076 | 8,939 | 44,186 | 1,265 | 66,614 | ..... |
| Unclassified | 61,110 | 28,030 | 31,720 | 11,024 | 101.100 | 902 |
| Advanced Manufactures: | | | | | | |
| Machinery | 52,913 | 16,205 | 41,433 | 10,974 | 113,514 | 40,544 |
| Machine boilers, etc. | 35,286 | 18,263 | 40,598 | 12,923 | 36,711 | 20,898 |
| Agricultural | 11,654 | 1,128 | 4,416 | 421 | 16,823 | 955 |
| Hardware | 32,102 | 15,891 | 49,389 | 13,206 | 86,996 | 33,032 |
| Metal mfrs. | 4,512 | 951 | 17,841 | 4,333 | 10,515 | 2,709 |
| Unclassified | 35,129 | 36,228 | 28,520 | 33,166 | 56,339 | 5,632 |

*Adjusted values.

## Pacific Coast Iron Industry (CONTINUED FROM PAGE 47)

Coast area from foreign and domestic sources outside the area.

| SIMPLE MANUFACTURES | | | | | | | ADVANCED MANUFACTURES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rails | R.R. Material | Mfrs. Wire & Wire Rope, Cable, Fencing, Wire Nails | Iron & Steel Pipe & Fittings, Plumbing Goods | Nails, Bolts, Nuts, Rivets, Chains | Structural | Unclassified (Computed) | Machinery | Machinery, Boilers, Tanks, Drums, Cylinders | Agricultural Implements | Hardware | Metal Mfrs., Safes, Doors, Lath, Furnaces, Pails, Pans, Stoves, Piling, Auto Parts, Cutlery, Grinding Balls | Unclassified | Movement Totals |
| 2,174 | 2,083 | 6,563 | 14,536 | 901 | 371 | 410 | 5,181 | 10,394 | 3,437 | 210 | 525 | 314 | 140,906 |
| 655 | 747 | 234 | 1,723 | .... | 30 | 30 | 529 | 1,425 | 12 | 1,290 | .... | 26 | 24,935 |
| .... | 426 | 7,898 | 8,195 | 2,868 | .... | 17,000 | 4,598 | 4,137 | .... | 17,331 | 1,540 | 24,292 | 139,960 |
| .... | 303 | 2,701 | 1,866 | 673 | .... | 3,800 | 1,742 | 9,990 | .... | 7,995 | 951 | 14,101 | 137,000 |
| 373 | 539 | 5,170 | 3,181 | 671 | 77 | 120 | 6,966 | 8,510 | 1,176 | 120 | 25 | 204 | 122,073 |
| 24 | 1,208 | 52 | 334 | .... | .... | 24 | 368 | 1,050 | 15 | .... | .... | 22 | 10,865 |
| .... | 803 | 12,150 | 9,620 | 3,311 | .... | 12,900 | 3,907 | 3,302 | .... | 25,756 | 10,661 | 16,956 | 139,982 |
| .... | 798 | 2,213 | 675 | 496 | .... | 1,700 | 1,238 | 7,410 | .... | 4,552 | 650 | 5,613 | 84,628 |
| 11,443 | 3,709 | 7,673 | 7,586 | 905 | 180 | 1,500 | 10,646 | 26,892 | 9,335 | .... | 4,205 | 2,404 | 124,531 |
| 1,622 | 1,849 | 146 | .... | .... | .... | .... | 1,057 | 1,387 | 46 | .... | .... | .... | 8,921 |
| 9,481 | .... | 21,326 | 56,444 | 627 | 66,434 | 80,200 | 8,524 | 9,819 | .... | 46,342 | 3,977 | 37,555 | 448,426 |
| 120 | .... | 323 | 1,375 | .... | .... | 32 | 3,459 | 19,511 | .... | 25,544 | 2,289 | 2,873 | 122,889 |
| 223 | 63 | 11,054 | 11,215 | 1,800 | 51,507 | 2,100 | 3,315 | 20,775 | 4,890 | 210 | 1,450 | 701 | 322,687 |
| 30 | 236 | 1,842 | 2,582 | .... | 997 | 4,300 | 3,248 | 6,848 | 158 | .... | .... | 7,748 | 36,622 |
| 8,431 | 551 | 28,348 | 193,444 | 3,125 | 55,198 | 41,600 | 39,819 | .... | 3,327 | 14,351 | 997 | 9,822 | 655,055 |
| 515 | .... | 6,023 | 8,387 | 4,060 | 7,912 | 19,900 | 10,686 | .... | 958 | 6,606 | .... | 14,353 | 298,110 |
| 70 | .... | 2,873 | 14,111 | 1,750 | 33,173 | 3,000 | 13,030 | 14,393 | 583 | 240 | 1,225 | 1,766 | 281,424 |
| .... | 30 | 501 | 1,004 | .... | 572 | 2,300 | 2,467 | 4,463 | .... | .... | .... | 7,738 | 23,618 |
| 1,613 | 229 | 6,353 | 68,728 | 2,290 | 10,936 | 15,700 | 17,530 | .... | 2,657 | 23,273 | 5,930 | 9,594 | 370,013 |
| 675 | .... | 4,427 | 3,326 | 3,682 | 693 | 7,000 | 6,902 | .... | 406 | 8,654 | 3,683 | 19,793 | 207,972 |
| .... | 158 | 3,742 | 2,555 | .... | .... | 1,000 | 28,000 | .... | .... | 330 | 2,250 | 4,543 | 209,639 |
| .... | 198 | 96 | 1,015 | .... | .... | 800 | 5,040 | .... | .... | 60 | 325 | 2,404 | 38,976 |
| 6,163 | .... | 55,273 | 168,516 | 42,551 | .... | 28,400 | 66,344 | .... | 7,488 | 40,324 | 83 | 11,837 | 1,910,628 |
| 6,963 | .... | 10,923 | 14,373 | 1,023 | .... | 70 | 30,988 | .... | 909 | 7,428 | 95 | 85 | 184,593 |

shipments from foreign and domestic sources.

This table gives an itemized tabulation of all the iron and steel movements.

The summary shows the following:

1. 1934 receipts show a decrease of 53 per cent under 1929.
2. 1934 receipts show an increase of 38 per cent over 1933.
3. 1934 shipments show an increase of 40 per cent over 1929.
4. 1934 shipments show an increase of 52 per cent over 1933.
5. In 1929 the water movement totaled 87 per cent of both receipts and shipments.
6. In 1934 the water movement had decreased to 63 per cent of the receipts but remained 87 per cent of the total shipments.
7. There was a 7 per cent increase in water importance 1933-1934.
8. The 1933-34 averages show a 28 per cent decrease of water importance over 1929 in receipts but with a gradual increase in importance back to normal (about 85 per cent).
9. The shipments show little change with a variance of less than 3 per cent from normal during the low period.
10. The normal water importance is probably about 85 per cent of the receipts and 90 per cent of the shipments. This has been increasing gradually with the shipments showing practically no effect of the depression.

| | | Totals | | Per Cent of Totals | | | |
|---|---|---|---|---|---|---|---|
| | | Received | Shipped | Received | Shipped | Received | Shipped |
| 1934 | Rail | 463,593 | 61,557 | 36.9 | 12.4 | 40% Rail | 12% Rail |
| | Water | 795,015 | 435,110 | 63.1 | 87.6 | 60% Water | 88% Water |
| | Total | 1,258,608 | 496,667 | | | | |
| 1933 | Rail | 403,497 | 34,483 | 44.1 | 10.5 | | |
| | Water | 509,995 | 292,600 | 55.9 | 89.4 | 28% Increase of Rail Importance | No Change |
| | Total | 913,492 | 327,083 | | | | |
| 1929 | Rail | 334,170 | 47,897 | 12.4 | 13.5 | | |
| | Water | 2,359,054 | 307,482 | 87.6 | 86.5 | 12% Rail | 13% Rail |
| | Total | 2,693,224 | 355,379 | | | 88% Water | 87% Water |

## Table 2—Two forecasts of consumption demand based upon data from Table 1.

| Assumption "A" Average 1933 and 1934 (90%) Received | Shipped | Assumption "B" Average 1929, 1933, 1934 (83%) Received | Shipped | Percentage of Item Recorded Available to Coast | Available Market for Coast Assumption "A" | Assumption "B" |
|---|---|---|---|---|---|---|
| 594 | 2,043 | 553 | 1,543 | .. | ..... | ..... |
| 77,355 | 1,300 | 89,027 | 1,067 | 80 | 61,900 | 71,200 |
| 11,782 | 194,547 | 14,604 | 151,532 | 0 | ..... | ..... |
| 2,257 | 269 | 1,639 | 179 | 90 | 2,000 | 1,500 |
| 13,039 | 401 | 10,112 | 274 | 100 | 13,000 | 10,100 |
| 4,289 | 978 | 2,949 | 4,857 | 90 | 3,900 | 2,700 |
| 7,805 | 484 | 7,140 | 333 | 90 | 7,000 | 6,400 |
| 23,926 | 6,827 | 78,160 | 15,336 | 75 | 17,900 | 58,600 |
| 228,950 | 2,925 | 237,833 | 3,687 | 90 | 206,100 | 214,100 |
| 58,073 | 10,261 | 41,880 | 6,840 | 80 | 46,500 | 33,500 |
| 40,298 | 4,852 | 87,615 | 11,304 | 80 | 32,200 | 70,100 |
| 117,371 | 46,529 | 421,871 | 44,866 | 70 | 82,200 | 295,300 |
| 6,442 | 950 | 13,324 | 3,535 | 60 | 3,900 | 8,000 |
| 2,347 | 1,661 | 2,854 | 1,790 | 50 | 1,200 | 1,400 |
| 40,205 | 8,997 | 56,141 | 9,827 | 70 | 28,100 | 39,300 |
| 161,515 | 9,950 | 186,044 | 12,221 | 80 | 129,200 | 148,800 |
| 8,358 | 4,456 | 20,299 | 3,311 | 50 | 4,200 | 10,100 |
| 75,631 | 5,102 | 72,625 | 3,401 | 70 | 52,900 | 50,800 |
| 46,415 | 19,527 | 64,643 | 13,319 | 60 | 27,800 | 38,800 |
| 47,173 | 13,590 | 69,287 | 22,574 | 20 | 9,400 | 13,900 |
| 37,942 | 15,593 | 37,532 | 17,361 | 30 | 11,400 | 11,300 |
| 8,035 | 775 | 10,964 | 835 | 40 | 3,200 | 4,400 |
| 40,746 | 14,549 | 56,162 | 20,710 | 20 | 8,100 | 11,200 |
| 11,177 | 2,642 | 10,956 | 2,664 | 20 | 2,200 | 2,200 |
| 31,825 | 34,697 | 39,996 | 23,919 | 30 | 9,500 | 12,000 |
| | | | | Totals | 763,800 | 1,115,700 |
| | | | | Adjusted totals (100%) | 848,700 | 1,344,200 |

## Table 3—Foreign iron and steel imports to Pacific Coast.

(Bureau of Foreign and Domestic Commerce.)
(Seven to 10-year averages.)
(Gross Tons)

| | Los Angeles | San Diego | San Francisco | Portland | Seattle | Washington | Totals | U. S. Totals | Per Cent of U. S. to Pacific Coast | Per Cent of Pacific Coast Simple Items Listed |
|---|---|---|---|---|---|---|---|---|---|---|
| Pig iron | 7,568 | ..... | 9,204 | 1,296 | ..... | 2,424 | 20,492 | .... | ... | 16.3 |
| Bar iron | 652 | ..... | 87 | 17 | ..... | 149 | 905 | 3,452 | 26.2 | 0.7 |
| Steel bar, ingots, bloom.. | 7,263 | ..... | 8,440 | 5,532 | ..... | 2,130 | 23,365 | 83,127 | 28.1 | 18.6 |
| I. & S. sheet, skelp..... | 3,007 | ..... | 2,957 | 108 | ..... | 876 | 6,948 | 15,471 | 48.9 | 5.5 |
| Tin plate, terne plate.... | ..... | ..... | 938 | 5 | ..... | ..... | 943 | 1,381 | 68.3 | 0.8 |
| Structural ..... | 5,043 | ..... | 8,905 | 2,067 | ..... | 2,094 | 18,109 | 97,391 | 18.6 | 14.4 |
| Rails ..... | 1,123 | ..... | 2,359 | 1,003 | ..... | 1,755 | 6,240 | 19,652 | 31.8 | 5.0 |
| Pipes, etc. ..... | 23,555 | ..... | 3,904 | 413 | ..... | 3,410 | 31,282 | 65,200 | 47.9 | 24.9 |
| Round wire ..... | 322 | ..... | 100 | 38 | ..... | 1,087 | 1,547 | 3,796 | 40.7 | 1.2 |
| Wire rope, insul. wire.. | ..... | ..... | 50 | 113 | ..... | 1,443 | 1,606 | ..... | ... | 1.3 |
| Barbed wire ..... | ..... | ..... | 876 | 707 | ..... | 401 | 1,984 | 7,106 | 27.9 | 1.6 |
| Nails and screws..... | 1,183 | ..... | 1,511 | 376 | ..... | 528 | 3,598 | 6,490 | 55.5 | 2.9 |
| Ferro-Mn. and alloys.... | 1,216 | ..... | 1,378 | ..... | ..... | 518 | 3,112 | 56,975 | 6.9 | 2.5 |
| Ferro-silicon ..... | 338 | ..... | 273 | ..... | ..... | 186 | 797 | Included above | | 0.6 |
| I. & S. scrap..... | ..... | ..... | ..... | ..... | ..... | 3,746 | 3,746 | 57,857 | 6.5 | 3.0 |
| Boiler and other plate.. | ..... | ..... | ..... | 386 | ..... | 403 | 789 | 2,765 | 28.5 | 0.6 |
| Wire rods ..... | 103 | ..... | ..... | 59 | ..... | ..... | 162 | 11,508 | 1.4 | 0.1 |
| Castings and forgings.. | ..... | ..... | ..... | 0.6 | ..... | ..... | 0.6 | 2,243 | 0.03 | ... |
| Total: | | | | | | | | | | |
| Listed imports ..... | 51,373 | ..... | 40,982 | 12,121 | Included→ | 21,150 | 125,626 | ..... | ... | 100.0 |
| Intercoastal receipts .. | 434,974 | 12,604 | 332,757 | 70,847 | 96,878 | Remaining Washington Unknown | 948,060 | Foreign receipts average 13.3 per cent of intercoastal receipts. | | |
| Grand total ..... | 486,347 | 12,604 | 373,739 | 82,968 | Included→ | 118,028 | 1,073,686 | | | |

ing of iron ores of the Pacific area has ever been made. Also the supplies for electric smelting differ profoundly from those required for blast furnace use.

(3) Previous investigations gave but little attention to fluxes, refractories and manganese.

(4) National inventories of supply are made for and pointed to consumers in the Eastern centers of production.

(5) The prospect for electric power that may be "the cheapest power on tidewater in the United States" introduces a new factor.

(6) The available ore and coke are more suitable for use in an electric furnace than for use in a blast furnace.

(7) The physical setting is good.

(8) Ballast cargoes for returning wheat and lumber vessels should give low cargo rates for imported mineral supplies.

(9) The Pacific Ocean market can be reached from a plant located on tide water.

(10) The Pacific Coast and the northwestern States have no iron smelting industry.

(11) The market for ferrous products has increased in size since the earlier reports were made.

## The Market

No detailed investigation of the market existed in published reports, nor in known private reports, and, because the last known investigation was made over seventeen years ago, it was determined to make a partial one.

The market investigation assumes that all ferrous products now made in the Western States are not within the fair field of the proposed Bonneville plant. It assumes that importations by rail or water are the only products that might be open to a new iron and steel plant. Consequently the movement by rail or deep water was studied for the years 1929, 1933 and 1934. These figures give the consumption of imported materials but not of the iron and steel that has been of indigenous origin.

The summary of the complete results is given in Table I and Table IA.

*Assumptions.* For the purpose of predicting the market the figures are grouped into certain assumptions. Assumption "A" postulates that the average of the years of 1933 and 1934 are what may be expected for the next five years. Assumption "B" postulates that the years 1933 and 1934 are too low and should be balanced by averaging in the figures of a high year. The results of these assumptions are then cast into quantities that appear to be the proportion of the whole that can be manufactured economically and sold by plants of the size and equipment that are expectable with a market of one to two million tons. The results are given in Table II.

Assumption "C" is based upon the postulate that the quantity of marine imports is the amount that can be made and sold within competitive limits. It is also the only set of figures over a seven to ten year period (1924-1933) that is available. See Table III.

## Conclusions

1. Competing with foreign manufacturers, there is an available market for simple products of 100,000 gross tons.

2. Competing with the Eastern manufacturers, there is an available market for simple products of 800,000 gross tons.

3. The ten year average is more comparable to the average for 1934, 1933, 1929 (assumption "B"), than for the average of the last two years (assumption "A"), the last two years being low and 1929 high and in most cases, the highest.

In this connection it is interesting to note the average of conclusions furnished by some dozen authorities:

| | |
|---|---|
| Pig iron and castings, net tons. | 250,000 |
| Sheets and plates, net tons..... | 210,000 |
| Bars and rods, net tons ..... | 350,000 |
| Pipe, net tons ..... | 300,000 |
| Tin and tinned products, net tons | 250,000 |
| Structural, net tons ..... | 212,000 |
| Rails, net tons ..... | 150,000 |
| Total, net tons .....1,722,000 | |

It would appear to be safe to conclude that there is a market for iron and steel on the Pacific Coast of products that are suitable for production in a small plant at competitive costs in excess of one million tons.

(TO BE CONTINUED)

# PLANT EXPANSION AND EQUIPMENT BUYING

*. . . American Smelting & Refining Co., New York, plans expansion and improvements in plant at Garfield, Utah, costing $500,000.*

o o o

*. . . Burroughs Adding Machine Co., Detroit, is considering erection of a plant at Plymouth, Mich., at total expenditure of $250,000.*

o o o

*. . . United Refining Co., Warren, Pa., has approved plans for enlargement and improvements costing $250,000 with equipment.*

## NORTH ATLANTIC

**American Smelting & Refining Co.,** 120 Broadway, New York, plans addition to main refinery and process division in plant at Garfield, Utah, installation of a new reverberatory furnace with accessory equipment, enlargement of power house with additional equipment and other general extensions. Cost about $500,000 with equipment. Work will be carried out during fall.

**United States Industrial Chemical Co.,** 60 East Forty-second Street, New York, has let general contract to Engineering Contracting Corp., North and Linden Avenues, Baltimore, for one-story addition to Fairfield Avenue plant, Curtis Bay, Baltimore. Cost close to $30,000 with equipment. United States Industrial Alcohol Co., affiliated organization, same address, has awrded contract to same company for one-story addition to plant on Benhill Avenue, Curtis Bay.

**Signal Officer,** U. S. Signal Corps, Governors Island, New York, asks bids until Sept. 8 for 5000 ft. of cable (Circular 2).

**Martin Rubber Co.,** 27-27 Jackson Avenue, Long Island City, New York, manufacturer of molded rubber products, has leased one-story industrial building at Long Branch, N. J., 15,000 sq. ft. floor space, for new branch plant, and will erect one-story addition, about 10,000 sq. ft. floor space.

**Kings Brewery, Inc.,** 225 Pulaski Street, Brooklyn, plans expansion and improvements in brewery, including extensions in mechanical-bottling division and installation of new beer-cannng machinery; new filter equipment, pumps and other machinery will be installed in other divisions. Cost about $75,000 with equipment. Shampan & Shampan, 26 Court Street, are architects.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until Sept. 8 for motor-driven pumping units and spare parts for Brooklyn and Charleston navy yards (Schedule 8689); until Sept. 11, parts for airplanes for Brooklyn yard (Schedule 900-9937).

**General Foods Corp.,** 250 Park Avenue, New York, has let general contract to H. K. Ferguson Co., Cleveland, for two additions to plant of Post Products Division, Battle Creek, Mich., six stories, 156 x 200 ft., for general production, and five stories, 100 x 145 ft., for service department, including machine shop, woodworking shop and other mechanical divisions, as well as laboratory units. Cost about $1,000,000 with equipment. This is part of a general expansion program being carried out by company at different plants in country, to represent a total expenditure of $2,000,000 for buildings and machinery.

**Fifth Avenue Coach Co.,** 605 West 132nd Street, New York, motor buses, plans three-story service, repair and maintenance garage and operating building at 1488 Madison Street. Cost about $85,000 with equipment. Francis Seaman, 140 Cedar Street, is architect.

**Control Instrument Co.,** Yonkers, N. Y., manufacturer of precision instruments and parts, has leased space in one of buildings at Bush Terminal, Brooklyn, for plant.

**Ciba Co., Inc.,** 627 Greenwich Street, New York, manufacturer of chemical and drug products, etc., has let general contract to Walter Kidde Constructors, Inc., 140 Cedar Street, for new plant at Summit, N. J., comprising two three-story units, 100 x 200 ft. and 65 x 100 ft. respectively and will establish main plant at that location. Cost over $350,000 with equipment.

**Commanding Officer,** Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until Sept. 18 for 30,000 to 50,000 practice bombs (Proposal 76).

**Commissioner of Institutions and Agencies,** State Office Building, Trenton, N. J., asks bids until Sept. 11 for oil-burning equipment for power house at local New Jersey State Hospital.

**Quartermaster,** Camp Dix, N. J., asks bids until Sept. 8 for one steel boiler, one blower unit and one blower control (Circular 4).

**Heyden Chemical Corp.,** 290 River Road, Garfield, N. J., has let general contract to Rich Co., 85 Delaware Avenue, Paterson, N. J., for four-story and basement addition, 50 x 61 ft. Cost over $50,000 with equipment. Arthur Haenichen, 349 Ninth Avenue, Paterson, is architect.

**Martin-Parry Corp.,** York, Pa., manufacturer of automobile bodies, plans expansion and improvements, including equipment for production of steel wall board products, a new line of output for company. Company has arranged for loan of $300,000 through RFC, larger part of fund to be used for purpose noted.

**Commanding Officer,** Ordnance Department, Frankford Arsenal, Philadelphia, will receive bids until Sept. 16 for 12,000 steel forgings (Circular 61).

**Common Council,** Myerstown, Pa., plans municipal electric power plant and distributing lines. Cost about $152,000 with equipment, of which fund of $68,715 is being secured through Federal aid. Proposed to begin work in fall.

## BUFFALO DISTRICT

**Jamestown Malleable Iron Corp.,** Tiffany Avenue, Jamestown, N. Y., has let general contract to Warren Construction Co., 335 Steele Street, for one-story foundry addition, 60 x 150 ft. Cost over $50,000 with equipment.

**Penn-York Oil Co.,** Olean, N. Y., plans power plant and air compressor station in connection with development of oil properties in Goodwill district, Warren County, Pa., where 600-acre tract has been selected. Entire project will cost in excess of $200,000.

**Defender Photo Supply Co.,** 664 Driving Park Avenue, Rochester, N. Y., manufacturer of photographic equipment, etc., has let general contract to Frank Maggio & Brothers, 374 Augustine Street, for one-story addition, to be known as Factory D. Cost close to $45,000 with equipment. Another one-story unit, to be known as Factory F, is planned; to cost close to like sum. Smith & Stickney, 154 East Avenue, are architects.

## NEW ENGLAND

**Commanding Officer,** Ordnance Department, Watertown Arsenal, Watertown, Mass., asks bids until Sept. 8 for aluminum alloy castings (Circular 65), gray iron castings (Circular 66), bronze castings (Circular 63), ball bearings (Circular 64), one gap lathe (Circular 70), five fuel-oil burners (Circular 72).

**Moore Drop Forging Co.,** 38 Walter Street, Springfield, Mass., has begun superstructure for one-story addition, 156 x 260 ft., for which general contract recently was let to Albert J. Daniels, Shrewsbury, Mass. Cost over $100,000 with equipment.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until Sept. 8 for one electric arc welding set, one remote control device, and one automatic start-and-stop device (Schedule 8693); until Sept. 15, 1350 bronze castings (Schedule 8668) for Newport, R. I., Naval Station.

**Vought-Chance Corp.,** Main Street, East Hartford, Conn., manufacturer of airplanes and parts, a unit of United Aircraft Corp., Hartford, has let general contract to R. G. Bent Co., 93 Edwards Street, for one-story addition, 63 x 80 ft. Cost close to $40,000 with equipment.

**United States Engineer Office,** First District, New York, asks bids until Sept. 8 for flexible bronze interlocked hose for station at Waterbury, Vt. (Circular 39).

**Keeney Mfg. Co.,** Newington, Conn., manufacturer of plumbing equipment and supplies, has let general contract to H. Peterson Co., Berlin Turnpike, for one-story addition, 40 x 40 ft.

**Chapman Machine Co.,** Terryville, Conn., has taken bids on one-and-one-half-story manufacturing unit, 35 x 60 ft. Sperry & Buell, Inc., Bristol, Conn., is architect.

## WASHINGTON DIST.

**United States Engineer,** Reproduction Plant, Fort Humphreys, D. C., asks bids until Sept. 10 for one vertical litho-plate coating machine (Circular 2).

**Consolidated Beef & Provision Co.,** Lombard and Exeter Streets, Baltimore, meat packer, has plans for one-story addition and improvements in present plant. Cost close to $40,000 with equipment. William F. Stone, Jr., 2612 North Charles Street, is architect.

**General Purchasing Officer,** Panama Canal, Washington, asks bids until Sept.

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10 for main propelling machinery and auxiliary equipment for diesel-electric tug. "U. S. Gatun" (Schedule 3173).

**Purchasing and Contracting Officer,** Holabird Quartermaster Depot, Baltimore, asks bids until Sept. 10 for one feed pump for boiler service (Circular 15).

**Bureau of Yards and Docks,** Navy Department, Washington, asks bids until Sept. 9 for one-story extension to shop building 174, Navy Yard, Norfolk, Va. (Specification 8244).

**Bureau of Ordnance,** Navy Department, Washington, H. R. Stark, chief, asks bids until Sept. 15 for tube, barrel, housing and liner forgings, and 110 sets one-pounder forgings.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until Sept. 8 for one precision tool-room lathe for Portsmouth, Va., Navy Yard (Schedule 8603); plow steel wire rope (Schedule 8694); until Sept. 15, pressure gun lubricating fittings (Schedule 8688), wire brushes for cleaning castings and platers' service (Schedule 8695), oil and grease cups (Schedule 8684) for Eastern and Western navy yards; motor generator equipment and spare parts for Washington yard (Schedule 8705).

## SOUTH CENTRAL

**Brown-Forman Distillery Co.,** 1908 Howard Street, Louisville, is considering multi-story addition on Dixie Highway, primarily for storage and distribution. Cost over $75,000 with equipment.

**Uncle Jo Bottling Co.,** Travis Street, Shreveport, La., has acquired property, 250 x 430 ft., on Southern Avenue, for one-story mechanical-bottling plant. Cost over $50,000 with equipment. Work will begin early in October. Clarence Goldberg is president.

**United States Engineer Office,** Vicksburg, Miss., asks bids until Sept. 22 for 12 locomotive-type screw jacks (Circular 50).

**Memphis Packing Corp.,** Memphis, Tenn., meat packer, has filed plans for one-story plant addition, for which superstructure will begin at once. Cost close to $100,000 with equipment.

**East Tennessee Light & Power Co.,** Bristol, Tenn., plans new transmission and distributing lines for rural electrification, about 50 miles, with power substation and service facilities; extensions will be made in main transmission lines in urban areas. Entire project will cost over $200,000 and will be carried out during next six months.

**Board of Trustees,** Charity Hospital, New Orleans, plans steam power plant, machine and repair shop, mechanical laundry and other mechanical departments in new multi-story institutional building at Tulane and LaSalle Streets. Cost about $8,000,000, of which $3,600,000 will be secured through Federal aid and remainder of $4,400,000 through State. Weiss, Dreyfous & Seiferth, Maison Blanche Building, are architects.

**Tennessee Valley Authority,** Knoxville, Tenn., asks bids until Sept. 9 for electrical cable conductor for transmission line from Brownsville to Tupelo, Miss.

## SOUTHWEST

**Banner Iron Works,** 4560 Shaw Street, St. Louis, manufacturer of gray iron castings, etc., has plans for one-story foundry addition, 80 x 81 ft. Cost close to $30,000 with equipment. Erection will be carried out by company forces.

**Chrysler Corp.,** 341 Massachusetts Avenue, Detroit, has leased one-story building, 200 x 250 ft., to be erected by Kansas City Industrial Land Co., Kansas City, Kan., in Fairfax Industrial District, for new factory branch, storage and distributing plant, with service and repair divisions. Cost over $150,000 with equipment. Contract for erection has been let to W. K. Martin Construction Co., Dwight Building, Kansas City, Mo. Charles E. Keyser, 609 Minnesota Avenue, Kansas City, Kan., is architect.

**City Council,** St. Francis, Kan., plans extensions and improvements in municipal electric power plant, including new diesel engine-generator unit and accessory equipment. Cost about $85,000. Financing is being arranged through Federal aid. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

**Griesedieck Brothers Brewery Co.,** 1920 Shenandoah Street, St. Louis, will carry out further plant expansion in addition to two new multi-story units, recently referred to, including additions to bottling works, storage and distributing buildings, and enlargements in mechanical departments. Entire project will cost over $300,000 with equipment. Janssen & Janssen, Chemical Building, are architects.

**Gainesville Refining Corp.,** Gainesville, Tex., recently organized, has approved plans for new oil refinery near town limits, including steel tanks for storage and distribution; work to begin at once. Cost close to $90,000 with machinery. G. A. Mattson is general manager.

**Standard Fence Co.,** Lufkin, Tex., manufacturer of iron fencing, etc., plans early rebuilding part of plant recently destroyed by fire. Loss about $40,000 with equipment.

## SOUTH ATLANTIC

**Jones Machinery Co.,** Bishop Street, N.W., Atlanta, Ga., manufacturer of machinery and parts, has plans for one-story addition, 60 x 100 ft. Cost close to $28,000 with equipment.

**Commanding Officer,** Ordnance Department, Augusta Arsenal, Augusta, Ga., asks bids until Sept. 2 for one gasoline pump (Proposal 3).

**Swift Mfg. Co.,** Columbus, Ga., will install a machine shop on first floor of new three-story building, 72 x 121 ft., at cotton mill, for which general contract recently was let to A. K. Adams Co., Atlanta, Ga. Entire project will cost over $100,000.

**Johnson County Electric Membership Corp.,** Smithfield, N. C., recently organized, care of Spoon & Lewis, Greensboro, N. C., consulting engineers, asks bids until Sept. 22 for construction of 77 miles of transmission and distributing lines in part of Johnson County for rural electrification, including pole hardware and fittings, wire and cable, transformers and accessories. Cost over $85,000. Financing has been arranged through Federal aid.

## WESTERN PA. DIST.

**United Refining Co.,** Warren, Pa., has approved plans for expansion and improvements in oil refinery, including enlargement in gasoline division, new steam power house, additional tank storage, new stack and other work. Cost close to $250,000 with equipment. H. W. Schmitt is secretary and general manager.

**Joseph S. Finch & Co.,** Schenley, Pa., distillers, subsidiaries of Schenley Distillers Corp., 20 West Fortieth Street, New York, plan six-story addition to distillery, 158 x 225 ft., for storage and distribution. Cost close to $375,000 with equipment. Carl J. Kiefer, Schmidt Building, Cincinnati, is company engineer.

**Pennsylvania Railroad Co.,** Pennsylvania Station, Pittsburgh, plans additions to engine house and locomotive repair shops at East Altoona, Pa., with facilities for handling larger locomotives. Cost about $75,000 with equipment.

## OHIO AND INDIANA

**William S. Merrell Co.,** Fifth and Pike Streets, Cincinnati, manufacturer of chemicals and drugs, has plans for works on Amity Road, comprising several one and multi-story units, with power house and other buildings. Cost close to $700,000 with equipment. Tietig & Lee, 34 West Sixth Street, are architects; A. M. Kinney, Inc., Carew Tower, is mechanical engineer.

**Ames - Baldwin - Wyoming Shovel Co.,** Wauseon, Ohio, plans rebuilding part of plant recently destroyed by fire. Loss about $45,000 with equipment. Main offices of company are at Parkersburg, W. Va.

**Standard Register Co.,** 107 Campbell Street, Dayton, Ohio, manufacturer of continuous roll printing equipment, manifolding registers, etc., has let general contract to Austin Co., Cleveland, for one-story addition, 150 x 175 ft. Cost over $100,000 with equipment.

**Ohio Farm Bureau,** Columbus, Ohio, Murray D. Lincoln, executive secretary, is at head of project to build an electric power plant for cooperative ownership in Highland, Ross, Fayette, Clinton and Pike counties, where transmission and distributing lines are planned for rural electrification. Cost close to $1,000,000. Financing will be arranged through Federal aid.

**Federal Prison Industries,** Department of Justice Building, Washington, asks bids until Sept. 8 for one swing saw and table, one single planer, one bandsaw, and one endless bed sander for Federal prison at Chillicothe, Ohio (Proposal 722).

**Contracting Officer,** Materiel Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until Sept. 9 for one portable antenna mast (Proposal 102), aircraft hose (Proposal 109); until Sept. 10, one 36-in. motor-driven bandsaw (Proposal 125), three beacon lamp assemblies (Proposal 116), 35 oxygen purifier assemblies (Proposal 111); until Sept. 11, five portable current transformers (Proposal 119); until Sept. 14, one electric-operated slip roll former, 96-in. capacity (Proposal 122); until Sept. 15, 150 scales (Proposal 123).

**Coca-Cola Bottling Works, Inc.,** 1329 Barr Street, Fort Wayne, Ind., has acquired property at Pontiac and Lillie Streets for one-story mechanical-bottling plant, about 100 x 150 ft. Cost close to $45,000 with equipment.

**Contracting Officer,** Quartermaster Corps, Jeffersonville, Ind., asks bids until Sept. 16 for wood-cutting, power-operated circular saws (Proposal 34).

**Meriam Co.,** 1955 West 112th Street, Cleveland, is completing an addition, 54 x 100 ft., equipped with a 10-ton traveling crane. A spur track of New York Central will run to building.

## MICHIGAN DISTRICT

**Burroughs Adding Machine Co.,** 6071 Second Boulevard, Detroit, is considering erection of plant on 140-acre tract at Plymouth, Mich., acquired several months ago, for production of line of auxiliary products, such as machine stands, metal furniture specialties, roll papers, etc. Cost over $250,000 with equipment.

**Fisher Body Division,** General Motors Corp., General Motors Building, Detroit, has plans for one-story addition, 25 x 725 ft., to No. 2 plant at Flint, Mich., for storage and distribution. Cost about $60,000 with equipment.

**Michigan Steel Tube Products Co.,** 9450 Buffalo Avenue, Detroit, has approved plans for one-story addition to branch plant at Shelby, Ohio, about 24,000 sq. ft. floor space. Cost over $65,000 with equipment. Company will consolidate two plants at Shelby as one main unit. Property adjoining Detroit works has been acquired for addition for storage and distributing divisions.

**W. B. Jarvis Co.,** Grand Rapids, Mich., manufacturer of automobile hardware, radiator caps, etc., has let general contract to Osterink Construction Co., Grand Rapids, for one-story addition. Cost over $40,000 with equipment. Pierre Lindhout, Grand Rapids, is architect.

## MIDDLE WEST

**E. I. duPont de Nemours & Co.,** 2101 Canalport Avenue, Chicago, manufacturer of metal enamels, paints, chemicals, etc., have let general contract to Albert S. Low, 510 South Dearborn Street, for one-story addition, 45 x 182 ft. Cost about $75,000 with equipment. Company headquarters are in Wilmington, Del. R. D. Rogers, last noted address, is architect.

**National Lock Co.,** Seventh Street and Eighteenth Avenue, Rockford, Ill., locks and locking devices, cabinet hardware, etc., has let general contract to Security Building Co., 717 East Jefferson Street, for one-story addition, 120 x 130 ft. Cost over $85,000 with equipment. Peterson & John-

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son, Swedish-American Bank Building, are architects.

**United States Engineer Office,** St. Paul, Minn., asks bids until Sept. 18 for six gasoline engine-operated, full-revolving locomotive cranes (Proposal 56).

**Chicago, Rock Island & Pacific Railroad Co.,** LaSalle Street Station, Chicago, has let general contract to Arthur H. Neumann & Brothers, Hubbell Building, Des Moines, Iowa, for one-story addition to engine house and one-story addition to machine shops, 80 x 122 ft., at locomotive shops, Des Moines. Cost about $160,000 with equipment.

**Village Council,** Farmington, Minn., is considering new municipal electric power plant. Cost about $120,000. Financing will be arranged through Federal aid. Buell & Winter Engineering Co., Insurance Exchange Building, Siox City, Iowa, is consulting engineer.

**Post Quartermaster,** Fort Francis E. Warren, Wyo., asks bids until Sept. 9 for new boilers and stokers, complete with controls and accessories for power house, and for stokers for existing boilers in station (Circular 8).

**Holly Sugar Corp.,** Colorado Springs, Colo., has approved plans for new beet sugar mill at Hardin, Mont., including storage and distributing buildings, power house, machine shop and other mechanical departments. Cost over $650,000 with machinery.

**Shelby County Rural Electrification Association,** Harlan, Iowa, George Hess, president, recently organized, plans transmission and distributing lines in part of Shelby County for rural electrification, about 100 miles. Fund of $267,500 has been secured through Federal aid. Work will begin early in fall.

**Stearns Magnetic Mfg. Co.,** 635 South 28th Street, Milwaukee, has begun erection of an extension to its plant, which will nearly double present capacity.

**Eugene Ambrose,** for many years a partner in F. O. Ambrose & Sons boiler works firm at Janesville, Wis., and formerly at Jefferson, Wis., has organized Ambrose Boilerworkers, and opened a general iron work and welding jobbing shop at Fort Atkinson, Wis.

**Twin Disc Clutch Co.,** Racine, Wis., manufacturer of industrial and tractor clutches, speed reducers, etc., is building an addition. 60 x 120 ft., part two stories and basement.

**Nielsen-Bruening Engineering Co.,** Beloit, Wis., manufacturer of special machinery, tools and dies, has moved to its new plant at 417-419 Eastern Avenue, and hereafter will operate as John Nielsen Engineering Co.

**Ampco Metal, Inc.,** 3830 West Burnham Street, Milwaukee, manufacturer of bronze alloy castings, non-sparking tools, die-set bushings, bearings, etc., has placed contracts for shop addition, 50 x 80 ft. Carl J. Zaiser is president and general manager.

## ◀ PACIFIC COAST ▶

**California Corrugated Culvert Co.,** Seventh Street and Carleton Way, Berkeley, Cal., manufacturer of metal culverts, etc., has let general contract to Austin Co., 516 Eighteenth Street, Oakland, Cal., for one-story addition, in part for storage and distribution. Cost about $60,000 with equipment. R. K. Cowell, Oakland address noted, is engineer.

**Los Angeles Water and Power Bureau,** 207 South Broadway, Los Angeles, has let general contract to Lynch Construction Co., 930 East Gage Avenue, for one-story machine shop, equipment storage and distributing building, and motor truck service and garage unit, 130 x 175 ft., at Independence, Cal., at $86,932, exclusive of equipment.

**Gay Engineering Co.,** 2650 Santa Fe Avenue, Los Angeles, manufacturer of ice-making and refrigerating machinery, precooling equipment, etc., has plans for one-story plant, 150 x 200 ft.; erection by company forces. Cost over $60,000 with equipment. W. E. Chadwick, Union League Building, is engineer.

**Bureau of Reclamation,** Denver, asks bids until Sept. 8 for five 150-kva. oil-insulated transformers, and two 15,000-volt disconnecting switches for pumping plant, Grand Coulee dam project, Grand Coulee, Wash. (Specification 825-D); until Sept. 10, six aluminum metal sash windows and two aluminum rolling doors for gate control houses, Boulder dam project, Arizona-California-Nevada (Specification 826-D).

**Fair Motor Service Co.,** San Jose, Cal., plans rebuilding machine works and motor service plant recently destroyed by fire. Loss close to $90,000 with equipment.

**Water Department,** City Hall, Tacoma, Wash., plans one-story municipal machine and repair works on South Union Avenue, 140 x 200 ft., with part of unit for equipment storage and distribution. Cost close to $75,000 with equipment.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until Sept. 8 for one watchmaker's lathe (Schedule 8654); until Sept. 11, spare parts for floats for airplanes (Schedule 900-9927) for San Diego Naval Station; until Sept. 8, electric cable for Mare Island yard (Schedule 8659); until Sept. 15, 2745 steel tubes for fuel oil heaters for Mare Island and Puget Sound yards (Schedule 8685).

## ◀ FOREIGN ▶

**Societa Anonima Esercizio Forni Elettrici,** Cedegolo, Bresica, Italy, manufacturer of heavy industrial chemicals, plans additions to plant for production of calcium cyanamid, for initial output of 7500 tons per annum. Cost over $400,000 with machinery.

**City Council,** Townsville, Queensland, Australia, asks bids until Dec. 17 for one 2500-kw. turbo-alternator with auxiliary equipment for municipal electric power plant.

**Phillips Electrical Works, Ltd.,** Brookville, Ont., electrical equipment and parts, has plans for two one-story additions, for which superstructure will begin in September. Cost close to $200,000 with machinery. J. B. McCarthy is vice-president.

## . . TRADE NOTES . .

**Ohio Electric Mfg. Co.,** 5900 Maurice Avenue, Cleveland, has appointed J. L. Vergilio Co., 942 Prospect Avenue, Cleveland, sales agent for northern Ohio.

**Cooper Alloy Foundry Co.,** Elizabeth, N. J., has organized Stainless Engineering & Machine Works, a new division, to specialize in machine work adapted to stainless and other heat-resisting metals. Harry A. Cooper is president, and M. J. Robert is vice-president and general manager.

**Hagan Corp.,** Pittsburgh, announces the formation of Patton & Bruce, 526 North Vandeventer Avenue, St. Louis, a firm to represent its boiler water conditioning and combustion control interests. Russell Patton and Warren C. Bruce are members of the firm, and associated with them is W. Scott Wilkie.

**Steel Distributors, Inc.,** Tioga and Salmon Streets, Philadelphia, announces the opening of a steel warehouse. J. J. Maguire is president; R. L. Cole, vice-president; W. Vaughan, treasurer, and C. E. Gormley, secretary.

**Reed-Prentice Corp.,** Worcester, Mass., machine tool manufacturer, has appointed Sterling-French Machinery Co., New Center Building, Detroit, as exclusive Detroit sales agents.

# New England Business At High Level

GENERAL business activity in New England moved sharply upward in July, according to an announcement by the New England Council, all-New England development organization. The council's index of general business advanced from 85.8 per cent of normal in June to 93.6 in July, with every component of the index contributing to the improvement. The index now stands at the highest level it has reached since June, 1930, and is 18.2 per cent above July of last year, when it stood at 79.2 per cent of normal.

The Employers Association of New Haven County, Conn., reports an increase of 2.5 per cent in industrial employment between June and July with a 9.8 per cent increase in the number of employees over July last year. The Manufacturers Association of Hartford County, Conn., reporting for 82 plants, shows the number of employees on Aug. 1 to be 99.4 per cent of normal with manhours worked at 76.2 per cent of normal. On Aug. 1, 1935, the number of employees was 88.4 per cent of normal and manhours worked 66.3 per cent of normal.

The improvement in business conditions in New England is further indicated by the percentage increases in local payrolls between July, 1935, and July, 1936, as reported by the following cities and towns:

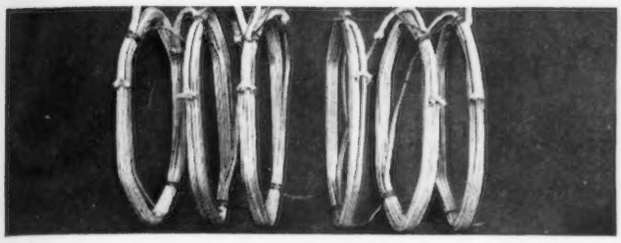
| | Per Cent Increase July, 1935-July, 1936 |
|---|---|
| Rochester, N. H. | +26.7 |
| Amesbury, Mass. | +23.0 |
| Attleboro, Mass. | +23.5 |
| Fall River, Mass. | +22.4 |
| Fitchburg, Mass. | +15.0 |
| Gardner, Mass. | +29.8 |
| Greenfield, Mass. | +19.3 |
| Bridgeport, Conn. | +13.1 |
| Derby-Shelton, Conn. | +26.7 |
| Norwalk, Conn. | +21.0 |

Orders for the products of Massachusetts factories continue to hold up well, according to the index of orders compiled monthly by the Associated Industries of Massachusetts. The July index remained at approximately the level of June and was 35.9 per cent above July, 1935.

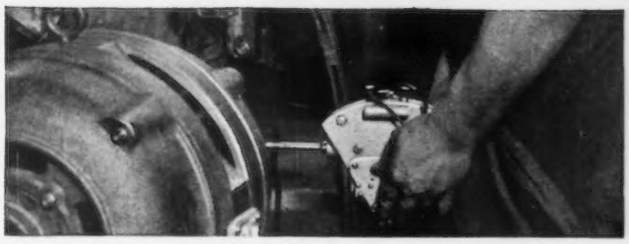
The value of building contracts awarded in New England in July amounted to $21,494,000, an increase of 14.8 per cent over June and nearly double the amount for July, 1935. During the first three weeks of August the value of building contracts awarded has been 75 per cent greater than during the corresponding period of last year.

Sealed-in leads. Brought through an opening in the frame—and there anchored permanently with a special sealing compound. The roughest kind of service during installation or afterward cannot put strain on the field connections.

Special cuff insulation. Empire cloth inside of two special preformed fibrous sheets is inserted in the stator core slots. An ingenious method of folding makes a self-locking cuff which gives permanent protection to the coil when it leaves the stator slot.



Group-wound coils. A phase group winding complete in one piece of wire reduces stub connections and eliminates a source of mechanical failure. Lead connections from these phase windings are *welded*, not soldered or brazed—an innovation in winding construction that keeps motors out of the repair shop.



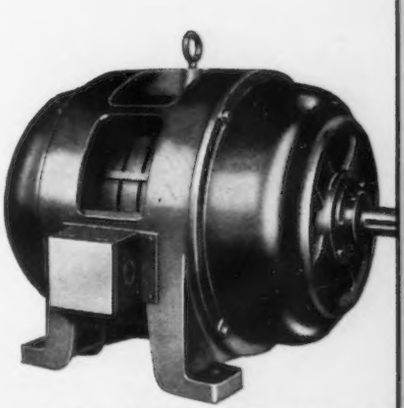
Every motor is given a thorough vibrometer test to make sure of proper dynamic balance. Eliminate vibration and you reduce to a minimum the wear on bearings. Sealed ball bearings and smooth running insure trouble-free service from F-M motors under the severest operating conditions.

# It's the little things that make a great motor

Certainly, a motor must come up to *electrical* specifications. But remember, a motor is an apparatus for converting electrical energy into *mechanical power*. And it's in the mechanical design and construction that you will find the biggest difference between one make of motor and another.

Fairbanks-Morse motors meet the most exacting electrical specifications. But with characteristic thoroughness, Fairbanks-Morse has achieved a position of leadership in *mechanical* design and construction of motors.

We illustrate a few of the new, unusual methods which are employed to make Fairbanks-Morse "Type Q" motors give longer, trouble-free service. The complete story of this extra value in motors will be sent on request. Address Department L481, Fairbanks, Morse & Co., 900 South Wabash Avenue, Chicago, Ill. 34 branches at your service throughout the United States.



F-M "Type Q" Ball Bearing Motor

©764EA40.112

106 YEARS OF PRECISION MANUFACTURING

# FAIRBANKS-MORSE *Motors*

POWER, PUMPING AND WEIGHING EQUIPMENT

# Coloring of Metals

(CONCLUDED FROM PAGE 35)

current density of 20 amp. per sq. ft.

**Formula No. 2—(Organic)**

Nickel ammonium sulphate, 10 oz. per gal.; sodium chloride, 5 oz. per gal.; boric acid, 2 oz. per gal.; and sodium citrate, 1 oz. per gal.; the pH, temperature, and current density are the same as in formula No. 1.

In general the rule in nickel plating on zinc is to use a rather dilute solution of nickel sulphate with some chloride added in order to secure good anode corrosion, and some boric acid added to maintain a constant pH.

## Avoiding Spongy Plates

A novel method of preventing the deposit of spongy nickel on zinc die castings consists of dipping the castings in a 5 per cent solution of $H_2SO_4$ containing 1 oz. per gal. of stannous chloride. The result is the deposit of a very thin film of tin which, unlike nickel, adheres well. At the same time it has a fairly high gloss. This method stops the nickel solution from reaching the base alloy and a good over-deposit of nickel later can be obtained. This method is discouraged because it causes a serious source of tin contamination when spoiled work is remelted.

It is possible to deposit copper on zinc directly, provided a cyanide bath is used. If a sulphate bath is used, copper is deposited by immersion with the same difficulty as described above for nickel. However, just as in the case with nickel, a copper sulphate bath can be used after die castings have been given a flash of copper by the cyanide method. A rather interesting point arises here. If copper is deposited directly on zinc-base die castings the coating will completely disappear after a few months' time[5]. The explanation of this is that the copper forms an alloy with the zinc and the two gradually diffuse, one into the other. The base metal being present in abundance gradually causes the complete disappearance of the deposited metal. This phenomenon can be prevented by first depositing a metal which does not rapidly or readily alloy with zinc. Thus it is possible to place the thin coating of nickel between the zinc base and the copper top-coating and have the total appearance relatively stable.

Despite all that has been said about the difficulty in plating die castings, successful technique has been developed and today most of the automobile hardware consists of die castings with a chromium surface deposit. These castings are first nickel plated and then plated with chromium. In a few cases the sequence is first nickel, then copper, then nickel again, and finally chromium. Where care is taken in the method of plating, the result is highly attractive and durable.

Pipe manufacturers have often inquired for a method of chromium plating galvanized iron pipes without an intermediate plate between the galvanized plating and the chromium. This is difficult but it can be done and is being done fairly successfully in production work.

In briefest terms the key to success in plating on zinc as on most other metals is "use a heavy coating." When sufficiently heavy copper is used directly on zinc the metal near the surface apparently becomes saturated with the brass diffusion and difficulty from that angle is overcome. Two methods of producing heavy coatings are being successfully used today. These are the multiple nickel method and the copper-nickel method.

Naturally in addition to plating for color effect any of the deposited coatings may be colored as described in other articles of this series. Thus in the lamp industry it is common practice to produce a sulphide black by treating a copper plated zinc die casting.

## Alloying for Color

The alloy best known for its color value in which zinc is prominent is manganese bronze. This alloy consists of 40 per cent zinc, 58 per cent copper and 2 per cent manganese. It has a very pleasing yellow-brown appearance which is exceptionally resistant to corrosion. In fact, its remarkable stability under the effect of sea water has caused it to be used extensively for marine hardware. Sometimes aluminum is added to manganese bronze, but in any quantities over 3 per cent aluminum has the effect of rapidly diminishing the ductility. Manganese additions in the zinc copper alloy may be up to 4 per cent to increase the strength without reducing ductility. Zinc is an important element in many attractive and variously colored alloys. Some of these have already been described in previous articles.

One of these which has not previously been described and which has an unusual yellow appearance is as follows: 68 to 70 per cent copper, 31 to 27 per cent zinc and 1 to 3 per cent aluminum. A similar alloy with a slightly different shade of yellow and different texture is as follows: 58 to 61 per cent copper, 38 to 40 per cent zinc and 0.5 to 1.5 per cent aluminum. Still another alloy in which zinc is prominent is so-called nickel-silver. In fact this particular name is given to a group of copper-zinc-nickel alloys of which the following four are perhaps the best known:

## Nickel-Silver Alloys

Alloy No. 1—66.7 per cent copper, 20 zinc and 13.3 nickel.

Alloy No. 2—33.3 per cent copper, 26.7 zinc and 20 nickel.

Alloy No. 3—53.3 per cent copper, 40 zinc and 6.7 nickel.

Alloy No. 4—7.4 per cent copper, 18.3 zinc and 74.3 nickel.

An interesting case where nickel is used as an important element in alloying to produce color effect is found in the case of black nickel which actually is a deposited alloy consisting in part of 50 per cent nickel, 7 per cent zinc, and 15 per cent sulphur. The balance in certain proprietary black nickels is made up of some unidentified inorganic compounds.

Many modified shades of brown may be produced with this same solution by varying the temperature, the chemicals or the concentration of the chemicals. Also some weak acids such as acetic acid or argol are frequently added to the solution with success. One modified form which has been successfully employed is as follows: Sodium thiosulphate, 240 grams; lead acetate, 25 grams; argol, 30 grams, and water, 1 liter.

[5] Recognition has been taken of this factor in setting up specifications by the leading automobile manufacturers who demand a minimum thickness of 0.0002 to 0.0003 in. of copper. While nickel-copper-nickel deposits are favorably viewed from the standpoint of durability, a great majority of die castings today are being plated using a coating of copper-nickel approximating 0.001 in. in thickness.